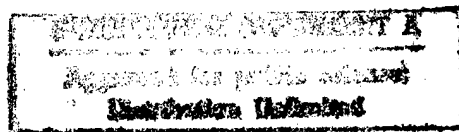


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15 October 1982



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# USSR Report

AGRICULTURE

No. 1354

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## LIVESTOCK FEED PROCUREMENT

### STEPS TO MORE EFFICIENT, LARGER FEED PRODUCTION REVIEWED

Moscow SEL'SKAYA ZHIZN' in Russian 31 Aug 82 p 2

[Article by N. Andreyev, academician of the All-Union Academy of Agricultural Sciences imeni Lenin: "An Important Element in Feed Production"]

[Text] The USSR Food Program envisions raising feed production in the country to 500 million tons of feed units in 1985 and 540-550 million tons in 1990. The challenge is formulated so that each farm will fully provide for the needs of its own animal husbandry units, above all their needs for high-quality coarse, succulent, and pasture feeds. These are precisely the types of feed I would like to discuss.

The weakest point in feed production has been and still remains the acute shortage of protein. It can be eliminated by significantly increasing the production of grain-legume field crops and legume grasses. Every natural zone of the country has potential for expanding the area planted to these crops and raising their yield. In the European part and the eastern USSR (the Urals, West Siberia, and Kazakhstan) for example, the production of peas can be increased sharply, while in the southern regions of the RSFSR, the Ukraine, Central Asia, and Moldavia more soy beans can be planted. In the arid regions of the country it is possible to plant more vetchling and chickpeas.

Among the perennial grasses alfalfa is particularly valuable. Bulk green alfalfa approaches concentrated feeds with respect to protein content in dry matter and quality. Alfalfa has good winter and drought resistance and can produce several cuttings not only in the southern parts of the country, but also in the northwestern and northeastern parts. It is difficult to overestimate the importance of clover in improving the protein balance. These crops can be the foundation of field feed production in many zones. The cereal grasses — smooth brome grass, timothy, calf's foot, meadow fescue, and others — also have great productive potential. It is advisable to allocate at least 20 percent of the crop area to them in the structure of perennial grass plantings, and about one-third in the Nonchernozem zone.

The silage crops also have great potential. Farmers in the central and northern regions today often raise late-maturing corn for silage; it seldom reaches the milky-wax stage. But the experience of leading farms illustrates that it would

be wiser in these regions to raise medium-early or medium hybrid corns. At the Zavety Lenina and Krasnaya Zarya Sovkhozes in Stupinskiy Rayon of Moscow Oblast, for example, farmers received 400 quintals and more of bulk green matter with ears in the milky-wax stage from cultivation of medium-maturing hybrids. The silage made from them is significantly more nutritious.

Along with corn and other traditional silage crops it is wise to make broader use of crops such as rape and Sosnovskiy cowparsnip, comfrey, jointweed, and mallow. Many farms in the Ukraine, Belorussia, Siberia, and the Far East are successfully raising Sosnovskiy cowparsnip, for example. Its advantages are that it can sprout in one place for several years without being reseeded and is capable of developing heavy greenery well suited for silage very quickly. In Moscow, Leningrad, and several other oblasts, for example, the yield from two cuttings of this crop reaches 500-600 quintals per hectare.

But natural haymeadows and pastures have been and remain the principal element in food production. In our country they cover an area of more than 320 million hectares. Extensive use of pasture and mowed feed also helps solve the protein problem. After all, the grass in crop pastures is a full-fledged biological feed which gives 110-120 grams of digestible protein per feed unit. Furthermore, grass is one of the most inexpensive types of feed.

Natural fields cover particularly large areas in Siberia and the Far East, more than 30 million hectares! Siberian scientists have calculated that if it were possible in the near future to raise the productivity of local natural haymeadows and pastures by just 30-50 percent through fundamental and reclamation improvement, it would be possible to supply livestock fully with valuable feed and free significant areas of arable land for grain crops. Grass is being prepared on a limited scale in remote regions, the flood plains of the Ob, Yenisey, Lena, and Amur rivers and their tributaries. To improve the work we need well-equipped mobile mechanized detachments. Pressing, briquetting and other progressive feed preparation technologies make it possible to reduce expenditures for transportation of the finished product and to expand the geography of feed production in a realistic manner.

Roughly half of all natural feed lands in the country are in the arid zone. Vast areas of pasture in deserts and semideserts have served as the basis for the development of sheep raising since ancient times. These lands are suitable for use during almost the entire year and produce inexpensive feed. However, their productivity is very low and varies greatly by years and seasons. In recent times these shortcomings have been aggravated by overgrazing of the pastures and those human activities that disturb the structure of desert biological communities. A radical means of improving such pastures may be sowing and undersowing a mixture of brush, semibush, and grasses. For example, protective strips of black saxaul, which serves as a good feed for sheep, effectively raise the productivity of desert pastureland. Such strips retain snow and create a favorable microclimate for the development of pasture vegetation. The productivity of pastures with black saxaul strips is twice as high as open land. Such strips have now been established on 180,000 hectares and protect more than 1.5 million hectares of pasture. There is no question that we should quickly improve more land in this way in the future.

And perennial pastures composed of a mixture of different species of desert vegetation are 3-5 and more times as productive as natural lands. They produce a stable yield by years and seasons and last a long time. They help introduce the progressive new technology of keeping sheep in enclosed cultivated pastures. One of the first to incorporate this technique was the Karnab State Breeding Farm in Samarkand Oblast in Uzbekistan. As a result the density of animals in the pasture increased 50 percent and the labor productivity of animal husbandry workers doubled.

Large areas of natural lands are located on slopes of more than five degrees. Much of this land is in the forest-steppe and steppe zones of the country. The haymeadows and pastures of the Nonchernozem zone are heavily dissected by ravines and gulleys. The productivity of a hectare of such land is just 20-30 quintals of bulk green matter. The processes of water erosion are highly developed on them. At many farms blocks of gully-ridden pasture have essentially become abandoned land. But even superficial improvement of such land can increase productivity 3-4 times, and fundamental improvement can do even better.

Special mention should be made of the role of floodplain lands in strengthening the feed base of animal husbandry. As the result of flooding and the silt it deposits these lands have exceptionally favorable conditions for the growth of grassy plants. Therefore the yield of grasses on such land is much higher than in dry valleys and pasture feed and hay is significantly better. Unfortunately, at the present time most of the floodplain meadows are swampy, covered with small hillocks, and sparsely grassed; they require improvement. The land improvement program that has been adopted offers an opportunity to significantly raise the productivity of floodplain meadows.

Many regions, above all the Nonchernozem zone, have accumulated useful experience with setting up feed production enterprises on floodplain lands based on inter-farm cooperation. Kaluga Oblast, for example, has the successfully operating Korma Interfarm Association, while in Tula Oblast the Poyma Association is in operation.

When selecting the method of use of the grass on cultivated perennial meadows consideration must be given to local conditions and capabilities: the size of the livestock units, the production technology adopted, the availability of feed harvesting machinery, the existence of good roads, the identity of livestock, and the remoteness of the crop rotation fields from the livestock unit. In many cases the pasture method is superior. At the Konstantinovskiy Sovkhoz in Moscow Oblast, for example, two similar groups of dairy cows and heifers were selected for testing under a specially developed program at the livestock complex. One group was grazed on cultivated pastures while the other was kept in a pen and fed from troughs filled with feed from the same pasture. The productivity of the cows kept in the pastures was higher than the penned group. During the pasturing period each of them produced 138 kilograms of milk more, and the daily milk yield was 1.1 kilograms higher. The prime cost of a quintal of milk received from the grazing animals was almost one ruble lower, while feed use to produce it was cut by 10 feed units.



It also proved more efficient to keep young breeding animals in pastures. Their average daily weight gain was 12 percent higher and the prime cost of a quintal of weight gain was 60 percent lower. This is entirely understandable because when green feed is given to animals in pens it must be cut, hauled to the farm, and distributed in the feeders. For each quintal of weight gain in the heifers of the penned group 80 feed units more was expended. Furthermore, the heifers kept in the pastures were tougher and less subject to various illnesses.

There is one more aspect of the matter that must be considered. With the rise in fuel prices expenditures for cutting and transporting feed have gone up significantly. Keeping animals in the pasture makes it possible to reduce energy, labor, and other costs.

Under conditions of intensive feed production the quality of the feeds being prepared and their preservation become very important. It has been calculated that total losses during feed preparation exceed 5 million tons of feed units. Therefore, of the 61-65 million hectares of arable land in the country used for feed crops some 15-16 million is going to cover losses. So in addition to expanding plantings of grain-legume crops, using intermediate sowing, and establishing highly productive pastures it is equally important to introduce progressive technology for preparing and storing feed. They lose up to 30 percent of their nutrients with traditional preparation methods, and even more is lost in bad weather. For example, the carotene content in hay dried in windrows is less than one-fourth the content in hay dried under an awning. Moreover, the use of modern, progressive technology for preparation and storage of feed makes it possible to preserve up to 80-90 percent of the nutrients.

Construction of storage facilities for silage, haylage, hay, grass meal, and other feeds using standard designs must be stepped up at the farms by every possible means.

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CSO: 1824/528

## LIVESTOCK FEED PROCUREMENT

### MERITS OF MIXED SILAGE AS FEED FOR LIVESTOCK DISCUSSED

Moscow SEL'SKAYA ZHIZN' in Russian 31 Jul 82 p 2

/Article by K. Solntsev, Academician at the All-Union Academy of Agricultural Sciences imeni V.I. Lenin: "Succulent Concentrates"/

/Text/ Mixed silage is rich nutritional feed. Each ton that is fed to livestock saves approximately 3 quintals of grain. What must be done in order to lay away mixed silage?

The production of special mixed silage is an effective method for obtaining rich feed for livestock. It was established some time ago that the dry substance of many succulent feeds possesses a nutritional value that is close to that of concentrates. It is this characteristic of such feed that makes it possible to balance more completely in terms of energy the rations of highly productive cows. However the use of concentrates from succulent feeds is a privilege that is reserved not only for a herd marked by a high milk yield. Taking into account the nutritional and biologically active substances contained in them, they can constitute from 25 to 40 percent of the ration for hogs and poultry and also calves and promote a fine productivity in them.

A considerable achievement of our domestic science is the development of the theory and practice of preparing mixed silage which, while retaining the valuable qualities of succulent feed, possesses a higher nutritional value and a raised level of biological richness. The organization of the production of such silage has solved in a radical manner the problem of prolonged storage of succulent feed and it has made it possible to create a specific mixed feed from root and vegetable crops, corn, leguminous grasses, melon crops, concentrates and other components. The nutritional value of a kilogram of mixed silage is 0.24-0.32 feed units and a kilogram of dry substance in it -- 0.8-0.9 feed units and the digestible protein per feed unit is no less than 70-80 grams. Mixed silage has fine taste qualities; it is the favorite feed of hogs, ducks, geese and chickens.

With the conversion of pig farming and poultry raising over to industrial technologies, some farms have drawn the erroneous conclusion that the use of mixed silage is not advisable at complexes owing to the technological conditions found there. As a result, interest in such silage declined for a certain period of time.

But it turns out that there is no basis for depriving hogs or poultry of mixed silage either at complexes or at conventional farms. For example, the procurement

and use of mixed silage are well organized at hog raising complexes of the Mariysksvinoprom farms. Over a year's time, almost 100,000 tons of such feed were fed to livestock at 45 farms. The livestock breeders have taken note of the positive effect which this feed has had on the fruitfulness and lactescence of the sows. It raises by 10-12 percent the weight increases in young stock undergoing fattening, animals which during the final period are fed up to 4 kilograms of mixed silage daily. The sowing areas and the crop structure for the feed production line at these farms are planned in a manner such that no less than 3 tons of mixed silage are laid away annually for each sow.

The production of feed is being carried out in a very intelligent manner at those kolkhozes and sovkhoses which annually increase the amount of mixed silage they lay away and which improve the composition, richness and quality of this feed. Such an attitude towards this feed prevails at many kolkhozes and sovkhoses in Belorussia and Lithuania and in Voronezh, Bryansk, Kursk and Gor'kiy Oblasts.

It is appropriate to mention the rich experience accumulated at the Order of Lenin Kolkhoz imeni Chernyakhovskiy in Kapsukskiy Rayon in the Lithuanian SSR. Here, over a period of many years, mixed silage has been a mandatory component in the rations for hogs. Taking into account the individual crop harvests and the availability of raw materials at a farm, the structure of the mixed silage can include 30-40 percent potatoes, 20-50 percent carrots with haulm, 15-20 percent root crops, 15-30 percent aftergrowth of leguminous grasses and 5-15 percent of grass meal from clover. A kilogram of such feed corresponds to 0.25 feed units and contains 25-30 grams of digestible protein and 30-50 milligrams of carotene. Pregnant sows, depending upon their pregnancy stage, are fed 3-6 kilograms of mixed silage daily, nursing sows -- 2-4, replacement young pigs -- up to 4 and gilts during fattening -- 2-3 kilograms of mixed silage. For each ton of weight increase, the kolkhoz saves 500-600 kilograms of mixed feed. The mixed silage is laid away in lined trenches, the carrots, beets and potatoes are washed in advance and the potatoes are steamed. Units for steaming, washing and crushing the components are included in the technological line. The fine experience accumulated at this kolkhoz is actively being introduced into operations at other farms. It is sufficient to state that 7,000-8,000 tons of excellent mixed silage are now being procured in the rayon.

Last year, for the country as a whole, approximately 9 million tons of mixed silage were placed in storage and this made it possible to save roughly 3 million tons of grain. This year the possibility exists of placing in storage a considerably greater amount. This will make it possible to save a considerable portion of the forage grain and at the same time it will raise the biological richness of the feed rations for the livestock.

When procuring mixed silage, a great amount of attention and exactingness must be displayed with regard to its quality. A distinction must obviously be made between the concepts: mixed silage and compound silage. If during the course of laying in silage for large-horned cattle and sheep, straw, potato haulm and other raw materials are added to the principal raw material (corn, grass, sunflowers), then such feed is quite properly considered to be compound silage.

Actually, the technology for and the quality of preparation of mixed silage are characterized by raised requirements with regard to the level of nutritional value: the content of crude cellulose (not more than 3-5 percent), carotene (not

less than 30-40 milligrams in a kilogram), dry substance (30-40 percent) and also the presence of readily digestible carbohydrates. And the ensiled bulk must as a rule contain leguminous grasses. This derives from the biological peculiarities of digestion in hogs and poultry. Any deviation from these rules renders the mixed silage of little use to them and fails to produce the desired results. Good mixed silage can obviously also be placed in storage for large-horned cattle.

The scientists have developed a sufficient number of recipes for mixed silage which take into account the zonal peculiarities of the feed base and these should be followed in a strict manner. For example, for the central regions of the country, the All-Union Scientific Research Institute of Animal Husbandry recommends that the mixed silage for hogs contain 30 percent fodder potatoes, the same amount of beets and carrots and approximately 10 percent meal made from leguminous grasses. For its zone, the Kazakh Scientific Research Institute of Animal Husbandry recommends that the silage be prepared using ears of corn -- 65 percent, beets -- 30 and grass meal from leguminous grasses -- 5 percent. They recommend that the silage placed in storage in this zone consist of 90 percent corn fodder and 10 percent grain waste products.

Work carried out at the Poltava Institute of Pig Farming must be viewed as a new development in the technology for producing mixed silage. It involves the use of chemical preservatives (mixtures of low-molecular acids) which lower the losses in dry substances, particularly sugar. An increase in the deliveries of chemical reagents to agriculture is creating fine prospects for their extensive use in the preparation of mixed silage.

Special attention must be given to a group of succulent feeds which have not yet become traditional and yet hold great promise for the future in view of their high nutritional value. Studies carried out by Krasnodar scientists have established the fact that a kilogram of meal made from carrots contains 0.87 feed units and 109 grams of protein, cabbage -- 0.84 and 112 respectively, marrow squash -- 0.72 and 47 and apples (pomace) -- 0.76 and 19. These feeds are rich in readily assimilable carbohydrates and in addition to being fine components for mixed silage can also be used as a substitute for grain in mixed feeds.

For some time now, the scientists have also been raising the problem of improving the use of beet pulp. The existing practice of feeding it to the livestock not in dry form but rather in damp and sour form has been causing considerable harm to the feed base. For decades the USSR Ministry of the Food Industry has been trying to justify the inability to dry out all of the pulp produced based upon a shortage of drying equipment and fuel. Only 10-12 million tons of pulp are processed into dry and highly valuable concentrated feed, a kilogram of which contains 0.84 feed units. But the sugar plants sour more than 50 million tons of pulp and make it available for feeding to the livestock in a sour form and with a loss of more than one half its nutritional value. It has been estimated that the production of dry concentrated feed from damp pulp alone by the sugar industry will require 1 million tons of standard fuel. This will furnish approximately 5 million tons of concentrate. For the production of an equivalent amount of grain forage in field crop husbandry, considerably greater amounts of fuel and resources are required. The time has come for USSR Gosplan to devote some attention to the status of affairs with regard to this pulp.

The extensive development of mixed silage production and the rational use of pulp -- these represent truly great reserves for augmenting the feed base for animal husbandry, reserves which must be actively employed for carrying out the food program.

## LIVESTOCK

### LIVESTOCK PRODUCTION OVERVIEW, SUMMER PERIOD

Moscow SEL'SKAYA ZHIZN' in Russian 14 Aug 82 p 4

/Review prepared by specialists attached to Main Administration of Animal Husbandry of the USSR Ministry of Agriculture: "More Output From Summer Feed"/

/Excerpts/ It is a busy period for farm workers. Taking advantage of the favorable conditions of the pasture period, they are striving simultaneously to increase the number of livestock, raise their productivity, fulfill successfully their obligations in honor of the 60th anniversary of the USSR and at the same time make a worthy contribution this year towards carrying out the country's food program.

Prior to the beginning of August the daily increase in milk yields on farms in the Russian Federation, compared to the level for last year, had reached an average of almost 1 kilogram per cow and at kolkhozes and sovkhoses in the Belorussian SSR -- 0.6 kilograms. The animal husbandry experts of Estonia are obtaining 11.5 kilograms of milk daily per cow, with somewhat lower results being obtained on farms in Lithuania and Latvia. The latter results however are still higher than last year's productivity level for the cattle. The farm workers in Leningrad, Moscow, Tula, Kaluga and some other oblasts of the RSFSR are obtaining 1.2-1.9 more kilograms of milk per cow than was the case at this same time last year. The productivity of the milking herd on livestock production farms in Belorussia has increased by 56 kilograms, Azerbaijan -- by 27, Uzbekistan -- by 21 and Armenia -- by 25 kilograms. For the country as a whole, the milk procurements for the period from May to July increased by 1 million tons, or 5.3 percent, compared to the same period for last year.

A great amount of work has been carried out during the past few years at the kolkhozes and sovkhoses in connection with specialization and concentration and the introduction of intensive methods for the raising and fattening of livestock and this has made it possible to expand considerably the scales for the fattening of large-horned cattle. At the present time, more than 7 million head of young large-horned cattle stock are being fattened at complexes and sites using industrial technologies. High productivity indicators are being achieved by livestock breeders at the sovkhoses Novo-Nikolayevskiy in Volgograd Oblast, Glazovskiy and Yulduz in the Tatar ASSR and Kormovik in Orenburg Oblast and by workers on other farms, where the average daily weight increases in large-horned cattle exceed 1,000 grams and the animals are being sold at weights in excess of 450 kilograms.

The skilful maintenance of the livestock on pastures and at summer camps and the favorable summer conditions have made it possible for the kolkhozes and sovkhozes to increase noticeably the productivity of the animals and the sale of products to the state. An increase has taken place in the average weight of large-horned cattle sold for meat purposes: on farms in Belorussia -- 11 kilograms, Armenia -- 20, Turkmenistan -- 10, Azerbaijan -- 9 and in Uzbekistan -- 4 kilograms.

The procurements of livestock products have increased on farms in Belorussia which, compared to last year, sold 28,500 tons or 6 percent more livestock and poultry to the state, milk -- 219,300 tons or 10 percent, eggs -- 33.3 million or 4 percent. The farms in Turkmenistan, Uzbekistan and Tajikistan are performing fine work this year in connection with the sale of meat, milk and other products to the state.

The kolkhozes and sovkhozes in Azerbaijan and Lithuania and in Bryansk, Volgograd, Gor'kiy, Kursk, Lipetsk, Tula, Smolensk, Orel, Kalinin, Kiev, the Crimean and a number of other oblasts are intensifying their rates for the production and state procurements of livestock products.

Meanwhile, the productivity of livestock continues to remain low in a number of areas owing to the unsatisfactory organization of feeding operations. Compared to last year, the daily milk yields for cows have decreased on farms in Volyno, Lvov, Ternopol, Kherson, Nikolayev, Rostov, Novosibirsk and some other oblasts. The average daily weight increase in large-horned cattle during fattening at some kolkhozes and sovkhozes does not exceed 400-500 grams during the summer period. Many kolkhozes and sovkhozes in Georgia, Kirghizia and a number of oblasts in the RSFSR and the Ukraine are selling cattle at low weight conditions.

Importance is being attached to making more complete use of the opportunities afforded by the pasture season for expanding considerably the fattening of livestock at specialized enterprises and at kolkhoz and sovkhoz farms. One reserve for increasing the production of beef must be that of raising the live weight of cattle being sold and shortening the fattening periods. A large source for the production of high quality beef in Kazakhstan, the republics of Central Asia and the Trans-Caucasus and in many oblasts in the Russian Federation is that of natural feed lands. The experience of leading farms reveals that when proper use is made of pastures the large-horned cattle show a weight increase during the summer period of 140-150 kilograms, with the average daily weight increases being 800-1,000 grams and with minimal expenditures of concentrated feed. Unfortunately, there are still many farms which are not utilizing this true reserve for economizing in the use of forage grain. Instead of ensuring that the livestock are supplied with ample amounts of green feed, some kolkhozes and sovkhozes in the Transcarpathian, Odessa and other oblasts, since the beginning of the grain harvest have sharply increased their issuing of concentrates to the cattle. On some farms, concentrates constitute 30-40 percent of the rations for livestock undergoing fattening.

The present period is a tense one on the hog raising farms. Many farms, taking advantage of the favorable summer conditions, have increased their numbers of young pigs, both for their own farms and for sale to the population. Deserving of praise are those farm leaders, specialists and livestock breeders who are persistently improving their feeding and maintenance of livestock and, on this basis, achieving a considerable increase in the production of pork.

In organizing full-value feeding for hogs, great importance is attached to the use of mixed silage. In recent years the preparation of such feed has become quite popular on many farms in the RSFSR, Belorussia, Lithuania and other republics. On farms in the Mari ASSR, the Mordovian ASSR and in Belgorod, Kursk and Rostov Oblasts, 2.5-3 tons of mixed silage are being procured for each principal sow. Many years of experience in the use of this feed in the rations for hogs serve to confirm its great economic value: reproduction of the herd is improved, the young stock thrive better, the cost of fattening operations is noticeably less and the consumption of concentrated feed is reduced by almost one third.

The agricultural organs and the leaders and specialists of kolkhozes and sovkhoses must undertake additional measures aimed at organizing full-value feeding for the livestock through the rational use of natural feed lands, permanent cultivated pastures and secondary and post-harvest sowings, the unconditional fulfillment of the tasks for procuring hay, haylage, silage and root crops and through further improvements in and strengthening of the feed base.

The fulfillment of the tasks for this year and the 11th Five-Year Plan on the whole will be dependent upon further improvements being realized in reproduction of the herd. This year the kolkhozes and sovkhoses increased their number of large-horned cattle by 607,000, including cows -- by 122,000 and poultry -- by 15.3 million. Hogs have remained at practically the same level as last year.

Increases have taken place in the number of large-horned cattle, hogs and poultry on farms in the Russian Federation, Belorussia, Uzbekistan and Turkmenistan. The number of calves obtained this year exceeds last year's figure by 74,000, lambs and young goats -- by 144,000 head. The sale of young pigs to the population increased by 19,000 head. The growth that has taken place in the number of animals, coupled with strengthening of the feed base, is creating the foundation for further increasing the production of farm products.

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CSO: 1824/501

## LIVESTOCK

### INCREASING RETURN ON CAPITAL INVESTMENTS IN LIVESTOCK

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 82 pp 59-62

/Article by A. Starkov and I. Dubinskiy: "Raising the Return From Capital Investments"

/Text/ Studies have shown that one of the most important reserves for lowering capital expenditures in livestock production is that of taking into account the zonal conditions. Meanwhile, little attention is being given as a rule to this factor in the construction of livestock production complexes. This alone may explain the paradoxical fact that in the southern regions of the country, where the livestock can be maintained in simple type facilities and even under the open skies during a considerable portion of the year, the cost of construction is not only not less but in fact it is higher than in the northern regions.

Thus, whereas the cost for the fixed productive capital for one livestock billet on the average for the USSR in 1980 was 2,329 rubles, in the Ukrainian SSR it was 2,633, Moldavian SSR -- 2,850 rubles, Georgian SSR -- 2,836 and Armenian SSR -- 2,884 rubles. The average cost for a livestock billet in Arkhangel'sk and Novosibirsk Oblasts is approximately 2,400 rubles, in Khar'kov and the Crimean Oblasts -- 2,800 and in Tambov and Donetsk Oblasts -- more than 3,000 rubles. The level of productivity of the animals in all of these oblasts fluctuates from 2,500 to 2,800 kilograms of milk per cow annually.

As a result, the output-capital ratio at complexes in the southern regions is lower than that for northern regions. For example, 0.77 quintals of milk were produced in Donetsk Oblast per 100 rubles of fixed capital and in Novosibirsk Oblast -- 1.1 quintals. Especially alarming is the fact that specific capital expenditures have continued to increase in recent years in some southern regions. In the Ukrainian SSR, the cost of a livestock billet at complexes placed in operation during the 1971-1975 period was 2,150 rubles, in 1976 -- 2,870 rubles, in 1977 -- 2,958 rubles and in 1978 -- 2,890 rubles. In order to ascertain the reasons for the high cost of construction in the southern regions and also to find opportunities for lowering it, monographic studies were carried out on complexes at the Novo-Lipetskiy and imeni Krasnaya Armiya Sovkhozses in Khar'kov Oblast. The studies revealed that the planning and construction of these complexes are based upon the stall maintenance technology, which is employed mainly in the northern regions. Similarly, just as in the northern regions, the principal buildings in which the livestock are maintained are built using heavy construction structures and they contain expensive systems for centralized heating and for the removal, storage and decontamination of farmyard manure.



An analysis of the structure of the estimated cost of complexes has shown that approximately 30-40 percent of the capital investments were expended for the erection of buildings using heavy and costly concrete structures of an industrial series, although it is known that in the southern regions buildings are required mainly for protecting livestock against the prevailing winds and precipitation. Almost 25 percent of the capital expenditures are used for heating and also for the removal and storage of manure.

Thus the practice which has developed in many areas of planning and building dairy complexes in the southern zone without taking into account its climatic peculiarities leads to a considerable (up to 30-35 percent) increase in capital investments.

During the 9th and 10th Five-Year Plans, Gipronisel'khos /All-Union Planning and Scientific Research Institute for the Planning of Standard and Experimental Agricultural Production Centers and Establishments for the Storing and Processing of Grain/ and the zonal planning institutes created a series of standard plans for dairy complexes for 800 and 1,200 cows, taking into account the climatic conditions of the various zones.

Jointly with the Scientific Research Institute of the Forest Steppe and Forest District of the Ukrainian SSR, Gipronisel'khos developed an experimental plan for a complex which was carried out at the Kutuzovka Farm in Khar'kov Oblast, at the Berezanskiy Sovkhoz in Krasnodar Kray and at the Rossiya Kolkhoz in Stavropol' Kray. A distinctive feature of these plans is the fact that the principal buildings and installations for maintaining the livestock are completed as simple unheated facilities and in Krasnodar and Stavropol' Krays -- as facilities of the semienclosed type. The animals are maintained on permanent litter and the manure is removed from the facilities once annually. This made it possible to do away with the complicated systems for removing and storing the manure and also the centralized heating system, since the deep litter ensures a warm bed for the animals.

Let us examine in greater detail the experience of the best of these complexes -- the Kutuzovka Farm. The capability of the complex -- 1,150 average cows annually; the estimated cost in modern prices -- 1.5 million rubles (in accordance with the effective plan 819-188, developed for the Kutuzovka type complex -- 1.7 million rubles). The estimated cost of a complex with stall maintenance for 1,200 cows is 2.3 million rubles.

In a computation for an equal number of livestock, the costs of construction at the Kutuzovka complex is lower than at a complex having stall maintenance by roughly 40 percent. A reduction in the cost of construction took place as a result of a reduction in the cost of the livestock yards (by 500,000 rubles) and refusing to use costly systems for the removal and storage of manure (198,000 rubles) and also for central heating (156,000 rubles). The additional expenditures for installing exercise yards with feeding sheds amount to 110,000 rubles. In addition to a considerable reduction in the cost of construction, the consumption of deficit materials (steel and reinforced concrete) was lower at the Kutuzovka by a factor of 2-2.5.

The effectiveness of milk production at complexes having different maintenance technologies is shown in the table.

Indicators of Production Activities of Complexes Having Different Technologies in 1980

Complexes	Maintenance Technology	Milk Yield Per Cow, in kg	Expenditures Per Quintal of Milk		Cost of 1 Quintal of Milk, in rubles	Profit, Level, in %	Cost of Fixed Capital Per:		Quoted Expenses Per Quintal of Milk, in rubles
			Feed, quintals of	Labor, in Man-hours			Livestock Billet, in rubles	Quintal of Milk, in rubles	
Kutuzovka, Khar'kov Oblast	Loose housing on deep litter	4193	1.15	1.8	13.47	81.6	1374	35.9	18.6
Berezanskiy, Krasnodar Kray	"	3415	1.03	2.8	16.3	56.2	840	22.0	19.0
Novo-Lipetskiy, Khar'kov Oblast	Loose housing-stall	2508	1.41	2.5	29.5	-13.0	2834	123.3	44.3
Urozhaynyy, Crimean Oblast	Tethered	3370	1.36	3.1	22.0	16.6	2400	71.2	30.5

The Kutuzovka complex surpasses all of the other farms in terms of all of the indicators without exception, including the level of productivity, overall production effectiveness and especially the effectiveness of capital investments. The effectiveness of the capital investments is especially high. The capital output ratio for output is less by a factor of three than the average for complexes in the Ukrainian SSR and two times less than that for the leading Urozhaynyy complex in the Crimean Oblast, where tethered maintenance is employed for the cows.

According to data supplied by the Scientific-Research Institute of the Forest-Steppe and Forest District of the Ukraine, the average milk yield per cow at the Kutuzovka complex over the past 4 years has been 4,026 kilograms, the production cost for a quintal of milk -- 13.8 rubles and the average annual profit -- 413,000 rubles and this ensures the repayment of capital investments within 3-3.5 years. It is obvious that the complex is troubled by certain shortcomings and that use is still not being made of all of the reserves that are available for further improving production operations. In particular, during some years the authorities tolerated low indicators for herd reproduction, a high level of concentrates in the ration and also a raised culling out of the animals. The collective is undertaking effective measures aimed at correcting these shortcomings. At the same time, there can be no doubt but that the many years of positive experience accumulated by the Kutuzovka complex warrants a great amount of attention.

Despite the obvious advantages, the experience of loose housing maintenance on deep litter is still not being employed extensively. The principal factor holding back the introduction of this progressive technology is associated with a shortage of feed. At the present time, straw is being used on a majority of farms for feed purposes and naturally there is not enough for litter. A great amount of labor and resources are being expended on many farms for processing and preparing straw for feeding to the animals. However, these measures are not solving the problem of providing rich feeding. It is possible to ensure that the complex is supplied with balanced feed in a reliable

manner only on the basis of making the best use of the land and raising the fertility of the soil. A principal condition for solving this task is that of employing a scientifically sound system of fertilization.

A great amount of importance is being attached to the accumulation and proper storage of organic fertilizers. A milk factory must be a factory for the production of rich organic fertilizers. Liquid manure is obtained from the non-litter stall maintenance of livestock. The storage, decontamination and utilization of such manure poses a difficult task and one which by no means is being solved successfully in all areas. A considerable portion of the manure runoff flows into rivers and ravines and contaminates the surroundings. In the case of loose housing maintenance on deep litter, it is possible to expend only minimal amounts of labor and resources in order to obtain high quality organic fertilizers, the decontamination of which takes place as a result of biothermal processes.

At the Kutuzovka Experimental Farm, straw in the amount of up to 1 ton per head annually is used for litter and rotted manure serves as the principal source for fertilizing the fields. On the average, up to 15 tons of manure and up to 6 quintals of mineral fertilizer are applied annually to each hectare of arable land at the farm. The fertilizer is applied for both the grain and forage crops. The average grain crop yield is 35-40 quintals per hectare and from each hectare of forage crops up to 5,500 feed units are being obtained, or twice as much as is being obtained at surrounding farms. Such a yield is making it possible to procure for one cow (without young stock) up to 8-9 tons of silage, 1.0-1.2 tons of hay and 1.2-1.5 tons of grass meal. A stable feed base made it possible, commencing in the autumn of 1976, to carry out year-round feeding of the dairy herd from storehouses, with no grazing of the animals on pastures during the summer period.

A study of the experience of leading farms, carried out over a period of many years by many scientific institutes and particularly by the Scientific-Research Institute of Livestock Production in the Forest-Steppe and Forest District of the Ukrainian SSR, provides the basis for recommending, as a promising variant for the southern zone of the country, the planning and construction of dairy complexes based upon the loose housing technology for maintaining livestock on deep permanent litter. In this regard, a need has arisen for creating a new standard plan for the southern zone of the country, one which will take into account the experience accumulated in introducing the industrial technology into operations and, in particular, the consistent implementation of the flow line-departmental organization of production. The plan should call for a maximum reduction in the estimated cost of construction and a cut-back in the expenditures of deficit materials.

Great reserves for lowering the cost of construction are to be found in beef cattle husbandry. At the present time, at beef production complexes just as in dairy animal husbandry, insufficient consideration is being given to zonal peculiarities and, as a result, the cost of construction in the southern regions is not lower and in many instances it is even higher than in the northern and eastern regions. Whereas the average cost of a cattle billet for the country as a whole at complexes for the raising and fattening of young large-horned cattle stock is 654 rubles, in the Moldavian SSR it is 674, Kazakh SSR -- 733 and in the Uzbek SSR -- 1,192 rubles.

In order to find methods for lowering the estimated cost of construction in the southern regions, plans were developed and on the basis of these plans six large

state complexes of the exposed type were built for the raising and fattening of 107,000 head and the production of 31,400 tons of weight increase annually. The average cost of a cattle billet at the sites was 360 rubles. This was less by more than a factor of two than the figure for conventional state complexes. However the overall effectiveness of beef production at the sites turned out to be considerably lower: the production cost for 1 quintal of weight increase at the sites -- 190.2 rubles and at conventional complexes -- 125 rubles; feed consumption -- 10.4 and 8.6 quintals of feed units respectively, average daily weight increase -- 687 and 725 grams and profitability level -- 4.8 and 42 percent.

Experience has shown that the locations for the complexes must be very thoroughly substantiated. In Rostov Oblast, for example, year-round fattening at exposed sites was difficult in view of the fact that the silage for feed and the litter for the animals froze during some months of the winter period and this precluded the possibility of normal feeding and rest for the animals. The production technology employed at exposed sites has still not been worked out to satisfaction.

Thus the experience gained in erecting complexes at exposed sites has underscored the possibility of reducing construction costs sharply. However the savings in capital investments was lost during the course of operating the complexes. The experiment in fattening at the sites should undoubtedly be continued, taking into account the mistakes made in the placement of the complexes and the need for improving the production technology.

In addition to the zonal peculiarities, considerable importance is also attached to the age structure of the animals when carrying out fattening operations. At complexes for the raising and fattening of large-horned cattle, the animals range in age from 15 to 300 or more days. Naturally the different animal age groups require different maintenance conditions. Whereas young calves as a rule require heated facilities with a controlled microclimate, the maintenance of older animals in a majority of rayons in the central zone requires the use only of simpler and unheated facilities. And in many southern regions this could be facilities of the semienclosed type and even simple sheds at exposed sites.

Gipronisel'khoz, jointly with the All-Union Institute of Livestock Production, developed plans for complexes with a technology for the combined maintenance of livestock, in which calves up to 6 months of age are maintained in heated premises with controlled microclimate parameters while older young stock are maintained in simple unheated (cold) premises. The plans call for the use of cheaper construction structures, particularly wooden structures. In this instance a reduction is achieved not only in the expenditure of power and fuel resources but also in the cost of construction.

Preliminary computations reveal that the cost of construction can be reduced by 15-20 percent and the expenditure of fuel and power resources -- by 40-50 percent.

An important condition for lowering the cost of construction is implementation of the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improving Planning and Intensifying the Effect of the Economic Mechanism With Regard To Raising Production Efficiency and the Quality of the Work." For many branches of industry, including construction, the plans call for a change in the principles of planning and in the indicators for effectiveness, such that

these indicators will reflect to a greater degree the contribution made by each collective towards achieving the final results.

For the purpose of evaluating the work of construction organizations, use is still being made of the obsolete indicator of gross output costs, which includes the cost of the construction structures and materials. Thus the contracting organizations are directly interested in using the most expensive construction materials and materials-intensive technological solutions.

Despite the fact that light weight construction structures for an agricultural series have been developed, the contracting organizations are carrying out the construction of livestock complexes using structures of an industrial series that increases the cost of a square meter of a building by 25 percent, with the expenditures of concrete and steel increasing by 47 and 24 percent respectively. Moreover, the desire to achieve gross indicators is preventing the rapid completion of projects and their introduction into operations. As a rule, the contracting organizations apply themselves energetically to the work during the initial stage of construction (foundations, walls), when the labor expenditures of the builders amount to approximately 10 percent of the overall cost of the gross output, and they display no haste during the final stage when the labor intensiveness of the work exceeds 60 percent of the cost of the gross output and they are "at a disadvantage." This leads to an immobilization of the capital investments and to growth in unfinished production.

At the present time, an indicator for the volume of marketable construction output in a monetary expression is being introduced for the purpose of evaluating the work of contracting organizations. At the same time, the activities of the construction-installation organizations will be reflected in the final results, that is, the projects placed in operation and prepared for the production of goods. The system of financing is changing substantially.

Earlier the builders were financed directly by the client during all stages of construction. Under the new system the clients pay the builders only for the cost of projects that have been placed in operation fully prepared for the production of goods. During all intermediate stages of construction, the financing is carried out by means of bank credit. In the process, the interest rates for the use of credit can be differentiated: they decrease if the project is introduced into operations ahead of schedule and they increase if the established construction periods are exceeded. This system will undoubtedly promote a concentration of forces and resources at underway projects, an acceleration in the placing in operation of production capabilities and a reduction in unfinished production.

Great importance is attached to the technical-economic justification for a livestock production complex during the pre-planning stage. In conformity with the directive instructions, prior to planning a complex the feasibility of construction, its rational location and capability and also the availability of all of the required resources, particularly the feed base and the livestock, in keeping with the requirements of the industrial technology, should all be thoroughly justified.

A study of the experience accumulated in the planning, construction and operation of complexes for the production of milk in a number of oblasts (Yaroslavl', Lipetsk, Kemerovo, Sverdlovsk and others) underscores the great mistakes being tolerated in this work.

The tasks which we examined for the planning and technical-economic justification of projects revealed that the planning documents are composed as a rule on a formal basis. This applies first of all to justifying the resources required. Thus the opportunities for obtaining high quality indicators (productivity, labor expenditures, feed, production costs and production profitability) are not justified. As a result, in the overwhelming majority of cases the actual resources available and the technical-economic indicators for production are indeed far from those planned.

Our inspection of the Luch complex in Lipetsk Oblast and the Kocherganovskiy complex in Astrakhan Oblast revealed the extent of losses that can occur as a result of a lack of sound data during the pre-planning stage. The planning task in which the feasibility of constructing complexes was justified guaranteed complete support insofar as feed was concerned. Actually however, the feed requirement is being satisfied by 50-60 percent and as a result of the mistakes made in the placement of the complexes objective difficulties are occurring with regard to satisfying their feed requirements fully and thus the complexes are not adequately staffed with livestock in terms of either quantity or quality. As a result, on 1 January 1981 the complexes which were placed in operation in 1975 were staffed with livestock to only 78 percent; instead of the planned productivity of 4,000 kilograms of milk per cow, the milk yield at the Luch complex was 2,200 kilograms and at the Kocherganovskiy complex -- 1,470 kilograms. The annual losses of each of these complexes exceeds 200,000 rubles. The capital-output ratio for output was higher by factors of 2 and 3.5 respectively than that for conventional type farms at sovkhozes of the USSR Ministry of Agriculture and the output-capital ratio was considerably lower.

For the country as a whole, the planned capabilities at dairy complexes were developed to only 62 percent. The complete mastering of the capabilities created can provide an increase in milk production of 2 million tons annually and this would be equivalent to the construction of 400 complexes for 1,200 cows each.

The energy problems are still not being resolved satisfactorily at the dairy complexes. A considerable increase is taking place at livestock complexes of the industrial type in the consumption of fuel and energy resources. Thus, for example, at dairy complexes built during the 1976-1980 period alone, which produce only 10 percent of the overall milk production, the annual consumption of fuel and electric power in a conversion for conventional fuel amounts to approximately 5 million tons.

Large boilers are being built at the complexes and a considerable number of ventilation-heating units installed. Studies have shown that the entire energy economy is being utilized in an extremely irrational manner.

An analysis of the peculiarities and character of heat consumption at the complexes and a study of the experience in their use reveals that the creation of centralized heating systems at dairy complexes is completely unjustified. They can be replaced by low power heat generators. Conditions must be developed for converting over to local power sources involving the use of electrical units which operate automatically. According to estimates by Gipronisel'khoz, this will ensure a savings of up to 1.5 million tons of standard fuel annually at those complexes alone which were placed in operation during the current five-year plan.

It bears mentioning that in a majority of European countries, where the average annual milk yield per cow is approximately 5,000 kilograms, the cow barns are not heated; they are equipped with controlled natural or mechanical (without heating) ventilation. Experiments carried out abroad have shown that with adequate hermetic sealing and thermal insulation of enclosing structures it is possible to manage without additional warming of the air so long as the outside temperature does not exceed  $-20^{\circ}$ .

An increase in the return from capital investments is a large and complex problem and one which is being solved not only in the sphere of planning and construction. It must be the object of attention by all organizations belonging to the agroindustrial complex.

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## REGIONAL DEVELOPMENT

### PLANS FOR IMPLEMENTING FOOD PROGRAM IN UZBEK SSR

Moscow SEL'SKAYA ZHIZN' in Russian 18 Aug 82 p 2

/Article by Ye. Aytmuratov, secretary of the Central Committee of the Communist Party of Uzbekistan: "Contribution to the Food Program"7

/Text/ The food program approved by the May Plenum of the CPSU Central Committee reflects the intensification of the party's efforts for a significant increase in the production of basic agricultural items. For Uzbekistan this program envisages responsible, new tasks for the maximum possible expansion of the food base in order to more fully meet the needs of the republic's growing population for food products through its own production. The plenum documents stress the need, along with the development of cotton growing, to increase the production of livestock products, vegetables and melon crops at accelerated rates.

Under Uzbekistan's conditions the cotton complex represents a structure that also has a decisive effect on other sectors of agriculture. After all, under our conditions all the estimates of an increase in meat and milk production are based on feed obtained from fields of cotton crop rotation, which includes such valuable preceding crops as lucerne and corn.

On farms where the standard of cotton crop rotation is quite high cotton harvests, as well as the yield from fodder fields, increase. That is why one of our basic tasks in the light of the food program is to increase the efficiency of cotton crop rotations and to complete their mastering in the very near future. I will refer to the example of Dzharkurganskiy Rayon in Surkhan-Darya Oblast. Cotton-lucerne crop rotation has been fully mastered here and the yield from an irrigated hectare stably amounts to 36 or 37 quintals of cotton, 220 to 240 quintals of lucerne in terms of hay, 95 quintals of corn for grain and 350 quintals of corn for silage. It is not accidental that the productivity of livestock and the volume of procurement of livestock products annually increase in this rayon. Recently, the Central Committee of the Communist Party of Uzbekistan approved the practical experience of the Dzharkurgan Party Organization in the management of agriculture. This year the rayon's kolkhozes and sovkhoses will increase the production of meat by 30 percent and of milk by 20 percent.

Party organizations take serious organizational and ideological measures to activate the people's efforts for the realization of the tasks set by the food program. Despite the present very severe water shortage party and Komsomol members



and all Uzbekistan workers have not capitulated before the element and are doing their utmost to unconditionally cope with the state procurement plan and the adopted socialist obligations for the sale of cotton and other field and farm products. New potentials of the rural economy have been activated during the short period following the plenum. This has enabled farms to envisage a significant growth of production of food products, including of meat, 20 percent, of milk, 18 percent and of eggs, 25 percent, in their plans for the current year. Such rates correspond to the task set by the republic's party organization and supported by all rural workers, that is, doubling and tripling the production of foodstuffs before the end of this decade and improving their quality everywhere.

Success depends on an overall approach and on a thorough and detailed solution of every problem. Let us take the development of animal husbandry. Is it possible to raise it to a new level without simultaneously providing the growing stock with feed? In exactly the same way it is hardly possible to greatly augment milk production without increasing the proportion of cows in the total herd, or to raise the productivity of animals without improving their breeding qualities. In the set of measures such problems as an improvement in the reproduction of young stock, establishment of heifer farms, expansion of a network of interfarm fattening houses and shops for feed preparation, development of the production of biological additives, construction of modern storage facilities for feed and food products and so forth are also being solved without fail.

From such broad positions the republic's party organization determined the strategy and tactics of its actions for the realization of all the sections of the food program. They demonstrated their effectiveness and began to bear fruits even during the initial period. During the current half-year, as compared with the same period last year, more than 30 rayons in the republic increased the production of livestock products by 25 to 30 percent. The goal of increasing milk yields per cow by 150 to 200 kg and the average delivery weight of large-horned cattle by 45 kg in the current year proved to be within their power. Farms in the Karakalpak ASSR, where milk yield per cow increased by 128 kg during the half-year, are outstripping the task set for milk production. On kolkhozes and sovkhoses in Dzhizak Oblast the delivery weight of large-horned cattle was 400 kg during the first half year as compared to 340 kg last year. As a result of the measures taken by party organizations farms in 19 rayons in the republic (they keep tens of thousands of cows) obtain more than 3,000 kg of milk per cow and 32 farms, more than 4,000.

However, we must not be silent about the fact that some sections manage things unsatisfactorily and fail to deliver a significant amount of products to the state. An analysis of the practical work at sections of 14 rayons, where the productivity of livestock was lower than the average republic productivity, was conducted in the Central Committee of the Communist Party of Uzbekistan recently. A discussion of this matter at the Central Committee of the Communist Party of Uzbekistan became a serious lesson for oblast and rayon party committees. A similar analysis is now locally performed at farms and sections and major potentials and local possibilities are set in motion.

The state and the farms themselves allocate substantial capital investments for the development of animal husbandry. To utilize them efficiently and to attain a quick return on every invested ruble--this is the most important problem, which

is not removed from the agenda of the Central Committee of the Communist Party of Uzbekistan, as well as of oblast and rayon party committees. In this connection I would like to discuss the practical experience of the Andizhan Oblast Party Organization, which was able to enlist all the potentials of the oblast's construction, installation, industrial and planning organizations in an accelerated establishment of large poultry breeding enterprises. Before the end of the five-year plan 14 poultry factories will be put into operation and the annual production of poultry meat will total 40,000 tons, or 10 times as much as in 1980.

The rates of construction of incomplete projects of the food complex have been increased. This will make it possible to put into operation dozens of new livestock enterprises and hundreds of production and cultural-general projects on farms by the end of this year. This work is carried out in an especially active way on 120 new sovkhoses established since the beginning of the current five-year plan, which specialize in the production of livestock products, as well as of garden crops, fruits, grapes and corn for grain and silage.

Potato production is increasing. During the current season the republic's new potato growing sovkhoses produced about 20,000 tons of early potatoes and in June occupied the vacated area with repeated plantings. The task of ever more fully providing the population with "second bread" through its local production is set. By the end of the 5-year period the gross output of tubers will approach 600,000 tons, which is twice as much as last year. It is important to speed up the work on the development of new potato varieties. Unfortunately, the Central Asian Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin does not pay proper attention to this problem.

The food program states that, in order to increase fodder grain resources, it is necessary to more fully utilize the great potentials of corn. This year the grain corn field in Uzbekistan occupies 300,000 irrigated hectares.

The republic's corn growers are competing for the production of 2 million tons of grain. These days many brigades obtain 80 to 100 quintals of grain and 350 to 400 quintals of silage fodder per hectare. Corn production will continue to increase rapidly.

During the decade the republic plans to raise the output of all types of grain to 4.5 or 5 million tons. An increase in rice production is also envisaged. A large rice growing region was established in the Karakalpak ASSR as a result of party and state concern. The complex unites 18 specialized sovkhoses. Last year they produced more than 300,000 tons of "white grain." In neighboring Khorezm Oblast rice production exceeded 100,000 tons. The large Sovkhoz imeni Al'-Khorezmi annually gathers 23,000 to 25,000 tons with a harvest of 60 to 65 quintals per hectare. A total of 37 rice growing sovkhoses were established in the republic in a short time. According to long-term measures rice production in Uzbekistan will increase to 1 million tons, that is, will double as compared with the attained level.

Experts in garden crops, horticulturists and grape growers also adopted increased obligations and decided to produce about 6 million tons of products on farms of all categories. The specialization and concentration of fruit and vegetable production is continuing.

Responding to the party appeal to make the food program a nationwide concern, the republic's rural workers are searching for new potentials of agricultural production. Cotton growers in Surkhan-Darya Oblast have begun a movement for the organization of livestock fattening in field brigades. This initiative approved by the Central Committee of the Communist Party of Uzbekistan is supported by the oblast's 2,600 brigades, which have also begun the fattening of large- and small-horned cattle, utilizing fodder grown on unsuitable land and along canals and irrigation ditches for this. Brigades use part of the meat for public dining and will sell the basic share--more than 5,000 tons--to the state. The Surkhan-Darya initiative is supported in all oblasts, rayons and farms in the republic. More than one-half of the field brigades, that is, 17,000 collectives, together with the performance of their main task and not in detriment to it, are now engaged in livestock fattening with local resources.

The food program is not a transient campaign. It is designed for a long period and requires extensive organizational work in all management links. At the same time, local possibilities must be supplemented with a more active participation of Union bodies. For example, the republic could more fully utilize its possibilities if it had a sufficient amount of transparent film for the cultivation of extra early vegetables under it. The problem of an accelerated increase in corn grain requires a rapid replenishment of the harvesting pool with combines capable of harvesting Uzbekistan's tall and high-yielding corn without losses.

Many unsolved problems remain in rice growing, Karakul breeding and the mechanization of vegetable growing, where manual labor is still utilized to a significant extent. The present difficult summer has shown that new efforts should be undertaken to expand the guaranteed irrigation base. It will be necessary to build on a larger scale new reservoirs, artesian underground water wells, irrigation canals with antifiltration coating and mudflow collectors and to increase the number of mobile pumping installation units. At the same time, it is necessary to intensify the concern for a reclamative improvement of irrigated arable land. Life demands an acceleration of preparatory work on the diversion of part of the flow of Siberian waters to the basin of the Aral Sea.

The food program envisages a certain growth of the production of food products as early as in the current year. From the very beginning the republic's party committees and primary party organizations have assumed a business-like posture and are trying to more rapidly and fully activate existing potentials. The disposition of party forces is being reexamined in rayons and farms. Thousands of party and Komsomol members are sent to new farms, animal husbandry sections, corn growing departments and brigades and subdivisions specialized in the production of rice, vegetables, fruits and grapes. New shop party organizations and party Komsomol groups are being established here.

In his speech at the festive meeting in Tashkent devoted to the presentation of the Order of Lenin to our republic Comrade L. I. Brezhnev, discussing the need for a significant increase in the volumes of agricultural production in all the country's regions, stressed that Uzbekistan could make an important contribution to this. We are proud of such confidence and will try to justify it. The republic's party organization is doing its utmost to ensure an unconditional fulfillment of the program for a further increase in food production for the population.

IMPROVED MATERIAL-TECHNICAL BASE OF AGRICULTURE URGED

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA EKONOMICHESKAYA in Russian No 4, Jul-Aug 82 pp 5-13

/Article by P. A. Klemyshev: "Problems in Development of the Material and Technical Base of the Agroindustrial Complex"/

/Text/ This article presents a brief historical survey of the development and modern state of the material and technical base of all the links of the agroindustrial complex. The imbalance of its individual elements is analyzed. Principal attention is paid to the tasks and ways of its further planned formation, to a proportional and interconnected development of all functional subdivisions of the agroindustrial complex, to an improvement in the structure of the material and technical base and to an accelerated development of the lagging links of the material and technical base of individual sectors.

The main task of the 11th Five-Year Plan and of all the 1980's lies in ensuring a rise in the well-being of the Soviet people, which presupposes primarily a radical solution of the food problem. In his speech at the 26th CPSU Congress L. I. Brezhnev said that "a rise in the workers' standard of living does not boil down to a growth of monetary income. As the CPSU Central Committee believes, the task of improving the supply of foodstuffs, as well as of industrial consumer goods, for the population is now put in the forefront" /2, p 45/. In the caloric value of food the Soviet Union is among the countries where the population's dietary level is high. The qualitative composition of the diet has improved considerably. However, its structure needs to be improved further. Moreover, in some republics and oblasts there are still difficulties with the population's food supply. The country's provision with foodstuffs and agricultural raw materials is the main task of the agroindustrial complex. The industrialization of agriculture and the development of a modern highly developed material and technical base for it and the processing industry is the economic basis of its formation.

L. I. Brezhnev's report at the May (1982) Plenum of the CPSU Central Committee and the USSR Food Program for the Period Until 1990 and the measures for its realization adopted by it especially stress the importance of an interconnected and more balanced development of the entire agroindustrial complex and an intensification of the production potential of all its sectors /7 and 8/.

Historically, production relations between industry and agriculture arise at early stages in industrial development. However, the formation of agroindustrial complexes occurs only on the basis of a high level of development of productive forces and the attainment of an organic unity of agriculture and industry, according to K. Marx's inspired foresight, is possible only under the conditions of socialism. The reality of practical socialism in the USSR confirms this fully.

Under the conditions of the economy of developed socialism the establishment of an adequate material and technical base of the agroindustrial complex became an urgent practical task. The prerequisites for the formation of the agroindustrial complex were systematically established from the beginning of the country's industrialization. The rates of development of the industrial material and technical base in the first--resource producing and capital forming--sphere of the agroindustrial complex can be approximately judged by the scale of growth of the volumes of deliveries of industrial means of production to agriculture and of the volumes of rural construction (table 1).

Table 1. Volumes of Deliveries of Industrial Means of Production to Agriculture (1940=1)

Means of Production	1965	1970	1975	1980
Tractors				
physical units	12	15	18	17
power units	14	21	30	31
Grain harvesting combines	6	8	7	9
Trucks	5	9	15	15
Tractors plows	4	6	5	5
Mineral fertilizers	10	17	29	26
Mixed feed	13	20	35	54
Rural production construction	11	16	27	34

In the output of tractors, grain harvesting combines and agricultural machines the USSR occupies the first place in the world. Beginning with the postwar period agricultural machine building, especially tractor building, rapidly increased its capacities. In 1970-1980 the average annual rate of its growth was 8.6 percent. However, the share of deliveries of tractors to agriculture out of the total volume of their production decreases invariably. In 1965 it was 67 percent and in 1980 it comprised 62 percent (in engine power).

Soviet tractor and agricultural machine building is a highly developed sector of machine building. The system of this sector's ministry includes about 20 tractor and motor production associations, more than 40 plants and associations for the production of agricultural machines and about 50 plants for the production of units, subassemblies and parts. Among other machine building sectors this sector is most specialized. The Ministry of Tractor and Agricultural Machine Building accounts for three-fourths of the total output for this purpose. In 1973 the Ministry of Machine Building for Animal Husbandry and Feed Production was detached from the Ministry of Agricultural Machine Building and other departments and made a separate sector. It was entrusted with the task of manufacturing machinery and equipment for the mechanization of livestock sections and complexes, procuring and preparing feed, as well as loading and applying fertilizers. Recently, the level of specialization of this sector's production also rose considerably.

However, basic machine building by no means fully meets the needs of agricultural enterprises and among the delivered equipment there are many structurally and technologically imperfect machines. Obviously, the output of spare parts lags behind machine production.

Therefore, a significant share of the production of equipment for agriculture and especially of spare parts is dispersed over numerous enterprises of various ministries and departments. Local party and state bodies are engaged in extensive work on the organization of patronage help to agriculture. Such help is provided through the manufacture of machinery, equipment and spare parts in plant shops for farms, specifically for livestock sections, allocation of metal and building materials, participation in the construction of agricultural projects and performance of field operations.

The vast volume of work on the manufacture of all kinds of machine attachments, on their modification, on the manufacture and restoration of spare parts, as well as on equipment repair, is performed in repair shops of sovkhozes and kolkhozes and at the enterprises of the State Committee for Supply of Production Equipment for Agriculture. According to our calculations, the cost of this work makes up one-third of the total cost of deliveries of all types of machines and spare parts by industry to agriculture.

The Communist Party and the Soviet Government manifest constant concern for the further development of agricultural machine building. The July (1978) Plenum of the CPSU Central Committee confirmed the decrees of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Further Development of Overall Mechanization of Agricultural Production and the Provision of Agriculture With Highly Productive Equipment" and "On Measures for an Increase in the Production in 1978-1985 of Highly Productive Equipment for Feed Production and Preparation and Overall Mechanization of Work at Livestock Sections and in Poultry Breeding."

These decrees envisage the following increase in the deliveries of equipment to agriculture (table 2).

During the 11th Five-Year Plan the volume of deliveries of equipment to agriculture will increase considerably. At the same time, as during the 10th Five-Year Plan, provision is made for outstripping rates of deliveries of working machines, which will contribute to the elimination of the existing disproportion between them and power facilities.

The realization of these decrees will greatly advance the provision of agriculture with a completed system of machines for overall mechanization of agricultural production. The development of the machine system begun during the 7th Five-Year Plan is of great importance for an improvement in the planning of the development of tractor and agricultural machine building, overall mechanization of agriculture and coordination of the activity of scientific and planning organizations of industry and agriculture. The sets of machines delivered by industry should correspond to the industrial technologies introduced into agricultural production. A total of 459 such technological sets are envisaged in the 1976-1980 machine system. The scientific development of industrial technologies encompasses ever newer sectors and sections of agricultural production. Therefore, the machine system is constantly improved and developed and ever newer machines and technical facilities are included in it. However, the rates of practical realization of the machine system greatly lag behind the rates of its development (table 3).

Table 2. Volumes of Deliveries of Equipment to Agriculture

Equipment	Volumes of Deliveries			Increase in Deliveries, %	
	1971-1975*	1976-1980*	1981-1985 plan	during 10th five-year plan	during 11th five-year plan
Tractors: thous. units	1700	1821	1870	7.1	2.7
mill. hp	119	150	182	26.1	21.3
Grain harvesting combines, thous. units	449	539	600	20	11.3
Trucks, thous. units	1102	1342	1450	22	8.0
Agricultural machines, bill. rub., total	15.8	21.9	31	38.6	40
including for plant growing	-	12.4	16	-	29
for animal husbandry and feed production	-	9.5	14	-	47.4

\*"Narodnoye Khozyaystvo SSR" [USSR National Economy] for the corresponding years.

Table 3. Development and Realization of the Machine System for Overall Mechanization of Agriculture

Equipment	Plant Growing		Animal Husbandry		Reclamation	
	1971-1975	1976-1980	1971-1975	1976-1980	1971-1975	1976-1980
Total included in the system of items of technical facilities	1290	1522	640	733	339	592
including:						
mastered in production	568	755	228	441	183	270
new designs developed	425	493	190	232	114	162
undergo state tests and recommended for production	297	274	222	60	42	70

Less than one-half (47 percent) of the total number of items of machines and attachments included in the machine system for overall mechanization of agricultural production is now in series production. Their remaining part is at the stage of testing or in the process of development of new designs. For this reason as yet farms do not have completed sets of machines for the cultivation of basic agricultural crops and mechanization of production processes in animal husbandry. Approximately 15 years pass from the time a new design is included in the machine system until it arrives on a farm. The lack of overall nature of the machine pool lowers

its efficiency, disrupts the completeness and regularity of the industrial process, does not make it possible to maneuver manpower during individual periods of work and creates the need to enlist outside seasonal manpower on a large scale for the performance of individual production processes. As a result, the time of performance of agricultural operations is prolonged, labor productivity growth is held back, yield is lowered and losses of products are increased.

The measures stipulated in the above-mentioned decrees, approved by the July (1978) Plenum of the CPSU Central Committee and confirmed by the 26th CPSU Congress create the material basis for an improvement in the relations between agriculture and agricultural machine building. They envisage a switchover from the output of individual machines to the development and introduction of technological sets of agricultural machines and implements into production, completion during the 11th Five-Year Plan of overall mechanization of the production of grain crops, sugar beets, corn, flax and cotton and rise in the level of mechanization of the cultivation and harvesting of potatoes, vegetables, fruits, grapes and other crops. Provision is made for a further significant increase in the output of highly productive, new equipment--combined units, large-capacity machines for the application of fertilizers, self-propelled potato, corn and tomato harvesting combines and self-propelled windrow harvesters--as well as for a full equipment of kolkhozes and sovkhoses with antierosion machinery.

The construction of new plants and the reconstruction and expansion of existing machine building enterprises will contribute to an increase in the production of machinery and equipment for animal husbandry and feed production. Advanced, new equipment--self-propelled and trailed fodder harvesting combines, self-propelled mower-crushers, round-bale presses, pickup stackers, trailed stack movers and other machines--is to be developed.

An important task--to basically complete overall mechanization of farming and animal husbandry during the period until 1990--is set for machine building ministries in the food program /8/.

Natural conditions on most of the country's territory require the construction of numerous capital buildings and installations for agriculture. The 70-percent increase in agricultural productive fixed capital during the period from 1965 through 1980 was due to the increase in the number of buildings and installations. The volumes of reclamation construction and of the construction of livestock barns increased continuously during this period. At the beginning of 1980 one-half of the stock of large-horned cattle, about 60 percent of the hogs, 55 percent of the sheep and 65 percent of the poultry were placed in standard livestock barns built during the preceding two five-year plans.

The scale of agriculture is vast. It accounts for about 40 percent of the volume of construction and installation work annually performed in all the national economy. More than 3 million workers are employed in the rural construction industry. Therefore, the problem of providing rural construction with the production capacities of construction organizations is of great importance, especially as it is still not solved in a fully satisfactory way. The development of the capacities of the rural construction industry is proceeding according to the following basic directions.



A system of state construction organizations of the USSR Ministry of Rural Construction was established for the performance of general construction work in rural areas. This system continuously builds up its capacities, the number of its primary contracting organizations rises steadily and their provision with machines and mechanisms increases. At the same time, the primary contracting organizations of the Ministry of Rural Construction in their size and technical equipment greatly lag behind the average level of construction organizations in industry. On the whole, the system of the USSR Ministry of Rural Construction does not yet meet the needs of construction in rural areas. More than 40 percent of this ministry's capacities, which are not sufficient by far, are diverted for the performance of work at industrial and municipal projects not directly related to agriculture. In 1979 the Ministry of Rural Construction performed only 14.2 percent of the total volume of construction and installation work in agriculture (without work in the construction of waterworks).

Contracting organizations of industrial construction ministries perform a large volume of special and general construction work for agriculture. Their proportion in the total volume of performed construction and installation work in 1979 comprised 19 percent, that is, it was much higher than the share of work performed by the Ministry of Rural Construction. As can be seen, rural construction leans to a significant extent on the production capacities of all construction ministries. Therefore, it cannot be concluded that it has reached a high level of specialization. On the whole, state contracting organizations perform one-fourth of the total volume of construction and installation work with due regard for the construction of waterworks as well. The "agriculture" sector performs three-fourths of all the work with its own forces, creating numerous construction organizations with its resources. Such a situation indicates a far from mature structure of the agroindustrial complex and an insufficiently high level of division of social labor.

Specialized water management organizations of the system of the USSR Ministry of Land Reclamation and Water Resources perform a vast volume of work on the implementation of the adopted long-term program for land reclamation. During the period from 1971 through 1980 the volume of construction and installation work performed by it increased 1.7-fold and the proportion of all work on reclamation in the total volume of construction and installation work in agriculture increased up to 20 percent. During that period fixed capital in reclamation installations tripled.

The system of interfarm construction organizations, which perform more than 30 percent of the total volume of construction and installation work and are the main contractor for kolkhozes, is the second important link of construction organizations in agriculture itself. This system is also developing rapidly. During 1970-1980 the volume of contract work performed by the forces of interfarm construction organizations increased 1.9-fold. At the beginning of 1981 this system had 4,194 construction-installation and construction administrations and mobile mechanized columns, 115 planning institutes and 209 organizations of material and technical supply.

Interkolkhoz construction organizations and individual sovkhoses and kolkhozes engage on a large-scale in the production of building materials, timber procurement and production of sawn timber, woodworking products, building bricks, tile and pre-cast reinforced structures and parts and extract and process nonore building materials (sand, gravel, quarystone, rubble and sand and gravel mixtures). At the end of 1980 there were 817 interfarm enterprises for the production of building materials and 842 timber procurement farms and timber sections.

Finally, the economic method is a very important form of construction management in agriculture. About 40 percent of the annual volume of construction work on kol-khozes and sovkhoses is performed by it.

In most cases the economic method of construction is a forced measure, because a significant volume of construction and installation work in agriculture is not ensured by the capacities of contracting construction organizations and centralized funds for material and technical supply.

The July (1978) Plenum of the CPSU Central Committee noted that, despite the big investments of state and kolkhoz funds in the establishment of the production base of rural construction, it still remains a bottleneck. The plenum paid much attention to problems of rural construction, proceeding from the fact that a "successful realization of the big program for the further rise of agriculture is directly connected with the organization of capital construction. Concern for the development of construction in rural areas has now become the most important component of the party's agrarian policy" [1, p 626]. The decisions of the May (1982) Plenum of the CPSU Central Committee, which outlined a vast program for production and social-general construction in rural areas and an improvement in its organization, usher a new stage in the development of rural construction.

The material and technical base of the central link of the agroindustrial complex, that is, agriculture, develops at high rates owing to an accelerated increase in the capacities of the investment complex (table 4).

Table 4. Development of the Material and Technical Base of Agriculture (1965=100%)

Material and Technical Base	1970	1975	1980
Agricultural productive fixed capital	144	237	344
Power capacities	139	197	261
Area of irrigated land	112	146	177
Area of drained land	96	129	159
Livestock population in terms of standard head	114	124	138
Agricultural land	101	101	102

The transfer of agriculture to an industrial basis places high requirements on an overall development of all the elements of its material and technical base.

The efficiency of functioning of the material and technical base of agriculture depends on factors of both economic and natural productivity. Man's active effect on his biological system and the attainment of the fullest realization of its potential productivity depend on the finding of the optimum correlation of economic productivity factors and their full combination with biological factors. Therefore, problems of an overall provision of agriculture with means of production are

of decisive importance for the attainment of bioeconomic optimums in the process of its industrialization. This determines the decisive importance of a planned and proportional development of the first sphere of the agroindustrial complex in a correct temporal and regional intercombination with the needs of agricultural development. On the whole, as can be seen from tables 1 and 4, there are big achievements in this respect. During the period following the March (1965) Plenum of the CPSU Central Committee alone the volume of fixed capital of agriculture rose more than 3.4-fold, the pool of tractors increased 1.6-fold (2.4-fold in terms of power), the areas of reclaimed land expanded 1.7-fold and the deliveries of mineral fertilizers tripled and of mixed feed, almost quadrupled.

However, the rates of growth of individual elements of the material and technical base of agriculture are not the same, which in many cases is not justified objectively and leads to a disruption in the proportionality of its development. Whereas, on the whole, the rates of deliveries of agricultural machines (including equipment for livestock sections) to kolkhozes and sovkhozes have increased considerably in the last few years as a result of the expansion of the list of deliveries, the rates of deliveries of power machines have greatly outstripped the deliveries of individual types of working machines. The average annual volume of deliveries during the 10th Five-Year Plan exceeded their volume during the 7th Five-Year Plan 1.7-fold in terms of tractors in physical computation and 2.8-fold in terms of engine power, whereas the volume of deliveries of seeders increased by only 17 percent, of windrow harvesters, 22 percent, of plows, 26 percent, of grain harvesting combines, 39 percent and so forth. It is evident from this how important the practical implementation of the following task set by the 26th CPSU Congress for tractor and agricultural machine building is: "To develop capacities and to organize the manufacture of the necessary set of highly productive machines for the introduction of industrial technologies into farming" [2, p 158].

The growth of the volume of fixed capital in terms of nominal value outstrips the growth of their volume in terms of the physical-material content. This occurs owing to the fact that, on the one hand, the technical level of new projects of fixed capital rises and, on the other, there is a continuous process of increase in their cost due to price formation factors. The changeover to the construction of capital barns for livestock and poultry on sovkhozes and kolkhozes, on the average, led to a triple increase in the cost of a livestock-poultry place as compared to 1965. The construction of livestock complexes, in which production is to be fully transferred to an industrial basis, is even more expensive. The cost of a livestock place in them is twice or threetimes as high as in ordinary farm sections. As a result, during three five-year plans the total population of all types of livestock and poultry in terms of standard head increased by 38 percent and the production of livestock products, 65 percent. However, the value of fixed capital in animal husbandry with due regard for the cost of animals increased 4.1-fold and without regard for livestock, 4.9-fold, which increased the capital-output of livestock products 2.5- and 3-fold respectively. At present, however, more than one-fourth of the population of large-horned cattle and sheep, 10 percent of the hog population and 5 percent of the poultry population are not provided with standard barns.

The insufficient development of the material and technical base is also manifested in the low level of provision of agriculture with means of transportation, production buildings, especially for the storage of products, installations for covered

ground, irrigated land, cultivated hayfields and pastures and intrafarm and public roads. The availability of grain, seed, vegetable and potato storage facilities meets approximately one-half of the need of farms. The need of farms for warehouses for mineral fertilizers, silage and haylage towers and other capital silage structures is met to a small extent. Owing to the unsatisfactory storage, considerable losses of nutrients and a complete spoilage of feed occur on a large scale.

During the 11th Five-Year Plan large capital investments are allocated for the construction of the indicated projects on kolkhozes and sovkhozes, which will make it possible to fundamentally improve the conditions of storage of products and feed and to reduce losses to a minimum.

The production and technical base of the processing industry and of the procurement, storage, transportation and sale of agricultural and final products is the third important component of the material and technical base of the agroindustrial complex. There is no need to discuss the importance of this sphere, because the entire result of the functioning of the agroindustrial complex, the efficiency of utilization of raw materials and the production and delivery of final products of the appropriate quality and in the necessary assortment to the customer depend on it. In fact, the development of this link of the material and technical base of the agroindustrial complex systematically lagged behind the development of agriculture. For this reason procurement and trade organizations have a shortage of capacities of elevators and facilities for the storage of grain, potatoes, fruits and vegetables. There is also a shortage of modern packaging materials for the transportation of vegetables, fruits and grapes. Advanced methods of loose and container transportation are developing, but very slowly. Isothermic transport ensures only part of the transportation of perishable products. There is an urgent need to change over on a large scale to advanced technologies of storage of potatoes, vegetables and fruits and to full mechanization of loading and unloading operations during their transportation. The solution of these problems is also entrusted to the newly established USSR Ministry of Fruit and Vegetable Industry, which should conduct a single technical policy in the field of production, procurement, processing, storage and sale of fruit and vegetable products in the country.

The enterprises of light, meat-dairy and food industry sectors for the initial processing of agricultural raw materials are not successfully placed in all cases. Many of them have an insufficient and technically obsolete production and material base. The task of more fully meeting their need for new equipment and of increasing the output of machinery fully corresponding to modern production requirements is set during the 11th Five-Year Plan.

Food industry enterprises will be placed in agricultural production zones. The main task of meat and dairy industry enterprises lies in the maximum possible introduction of advanced waste-free technology of processing of scarce raw materials, that is, livestock, poultry and milk, expansion of the assortment and improvement in the quality of meat and dairy products and a full utilization of production waste for the production of feed for animal husbandry.

Considerable retooling on the basis of modern equipment will take place in the hulling and milling industry, in the cotton cleaning industry and in the industry for the initial processing of wool, hides, furs and bast plants. The advanced method of industrial preparation of flax stock in shops of flax plants should become the prevailing method.

It is necessary to improve the economic mechanism so that it may create interest among processing industry sectors in an accelerated increase of their production capacities. At present they have a fear of reduction in the indicators of their loading as a result of the expansion of their production apparatus. Evidently, this is one of the basic reasons for an incomplete utilization of the allocated capital investments by individual republics, for the late commissioning of new enterprises and for the long periods of their mastering.

The development, rise in the technical level and improvement in the structure of the material and technical base of agriculture, the processing industry and the infrastructure will make it possible to minimize losses of agricultural products, which are now considerable, and to increase the consumption fund of the country's population respectively.

The ways of development and improvement in the production and technical base of agriculture, infrastructure sectors and the processing industry are outlined by the decisions of the 26th CPSU Congress and the May (1982) Plenum of the CPSU Central Committee. Their systematic implementation will ensure a coordinated development of the entire national economic agroindustrial complex, transition to new methods of management and planning and improvement in economic relations among the partners of the agroindustrial complex.

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## AGRO-ECONOMICS AND ORGANIZATION

### APPEAL TO INDUSTRY TO DEVELOP SUBSIDIARY ENTERPRISES

Moscow PRAVDA in Russian 13 Sep 82 p 1

/Article: "Agricultural Department of an Enterprise"

/Text/ An economic and vital socio-political task is that of ensuring that the country's population is supplied with food products as rapidly as possible. The subsidiary farms of industrial enterprises can play a considerable role in carrying out this task.

During his report delivered before the May (1982) Plenum of the CPSU Central Committee, Comrade L.I. Brezhnev noted: "Greater use can be made of the potential afforded by the subsidiary farms of enterprises. Each industrial enterprise and each organization that is capable of managing such farms must as a rule have them. Towards this end, the industrial enterprises and organizations must be allocated the necessary agricultural land."

The mood of an individual and, it follows, the productivity of his labor are greatly dependent upon the variety offered in the menu in a worker's dining hall, in the family of a worker or at a plant recreation base. This is well understood, for example, by the leaders of the Nizhnekamskneftekhim Production Association, where a subsidiary farm produces 18 kilograms of meat for each worker and where this indicator will be raised to 56 kilograms by the end of the five-year plan. "Meat departments" are operating successfully at dozens of enterprises in Mogilev Oblast. Their experience is interesting from the standpoint of the methods employed for organizing the work. Thus, if the enterprises are unable to organize a subsidiary farm independently, they create them on a share basis involving the participation of several collectives.

This year there are more than 19,000 plant agricultural departments in the country and yet their proportion with regard to the overall production volume for food products is still not very great. Knowledge is still lacking in many areas with regard to making use of previously unproductive lands, the heat from industrial production operations and food scraps. The view that a subsidiary farm is nothing more than a burden or matter of secondary concern is taking its toll. Thus, approximately two thirds of the enterprises of the chemical and motor vehicle industries and tractor and agricultural machine building lack subsidiary farms.

The local party and professional trade union committees must support in every possible way all initiative aimed at improving the work of subsidiary farms and

they must deal more strictly with the economic leaders when the latter fail to devote proper attention to the agricultural departments. The experience of those enterprises where measures associated with their development have been included in collective agreements and in the plans for the social development of collectives should be approved. This will promote control over the creation and development of agricultural departments.

At the same time, not everything is dependent solely upon the leaders of the enterprises. Many barriers still exist along the path leading to subsidiary farms. Surely one of the most critical problems has to do with the fact that the industrial enterprises lack agricultural implements, farm equipment, materials, fertilizers and young stock. Where can all of these items be obtained? The workers in Leningrad found an answer to this question. This is not the first year that tasks have been established for the Ptitseprom Trust and the Novyy Svet Sovkhoz Association with regard to supplying the subsidiary farms and population with young stock. The problems concerned with supplying the farms with agricultural machines and technological equipment for the farms have been solved on a centralized basis. The requests for them are included in an order of the oblast administration of Goskomsel'khoshtekhnika and are satisfied regardless of the departmental subordination. The subsidiary farms are provided with assistance in the form of fertilizer and high quality seed.

However, more often than not the local soviet organs, Goskomsel'khoshtekhnika and the land reclamation specialists do not indulge the subsidiary farms of enterprises with their attention. The plans make no provision for resources for the plant agricultural departments. And in order for them to have good prospects for development, they must be provided with the necessary equipment and special purpose machines.

A question arises with regard to the availability of feed for the subsidiary farms. But a considerable amount of experience has been accumulated in this area, experience which prompts a solution for the problem. When several years ago the 2d Nakhodka large panel housing construction trust acquired its own farm, the feed was procured with an overpayment at nearby sovkhoses. At the time, mention was made of the dining hall's food scraps; the dining hall had approximately 1,000 customers daily. The municipal public catering trust agreed to supply them to the farm upon the condition that a portion of the meat would end up in the common kettle. The municipal housing office of the trust was tasked with ensuring that containers for collecting the food scraps were installed at the workers' boarding houses. Several trucks were re-equipped for delivering them to the farm. The results were immediately forthcoming. On the average, more than 16 additional kilograms of meat were obtained for each worker at the trust, not counting that which was used for dinners in the dining hall. The trust's agricultural department began to show a profit. In addition, 500 young pigs were sold to the builders for the private plots. Thus it is apparent that reserves are available and the only requirement is that they be employed in a thrifty manner.

In the development of subsidiary farms, much depends upon the attention given to the work by the local soviet organs. They must provide the industrial enterprises with land for their agricultural departments in a timely manner, land that is located not too far from the production operations and they must coordinate the development of the subsidiary farms of the various plants. The assignment of plots

of land in the same area for several enterprises will make it possible to organize electric, heating and water supply and the building of roads in a better manner and with less expenditures.

It is well that subsidiary farms are being created at some large enterprises which are intended mainly for satisfying the food requirements of recreation bases. Here the guests willingly furnish assistance on a voluntary basis to workers attached to the agricultural departments. Such socially useful work does not inhibit full-value recreation but rather it makes it more diverse and interesting. This experience is deserving of serious attention.

The role played by subsidiary farms in solving the tasks called for in the food program will increase. This is why it is necessary for the party, soviet and professional trade union committees and economic leaders to devote constant attention to the development of the plant agricultural departments. Indeed, this great work is directly associated with satisfying the increasing requirements of our Soviet people, increasing the stability of the labor collectives and raising the productivity of social labor.

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## AGRO-ECONOMICS AND ORGANIZATION

### PLANS FOR STRENGTHENING AGROINDUSTRIAL COMPLEX IN LITHUANIA

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 82 pp 3-14

[Article by P. Grishkyavichus, 1st secretary of the Central Committee of the Communist Party of Lithuania: "Agroindustrial Complex of the Lithuania SSR, Results and Prospects for Development"]

[Excerpt] During the period following the March Plenum, based upon decisions handed down by the party congresses and subsequent plenums of the CPSU Central Committee, a tremendous amount of work was carried out aimed at achieving steady growth in agricultural production. Among the many important measures implemented, an important place was occupied by strengthening of the branch's logistical base, raising the material interest of the farms and agricultural workers and intensifying interrelationships between agriculture and other branches of the agroindustrial complex.

The increasing concern of the party and state for strengthening the logistical base for agriculture in the republic is manifested mainly in the steady growth in capital investments in this branch. The volumes of such investments have increased from five-year plan to five-year plan and during the 1976-1980 period they amounted to more than 3.3 billion rubles, or more than the 1961-1965 period by a factor of 3.8. In all, over the past three five-year periods 7.9 billion rubles have been invested in agricultural development in the republic, including 5.9 billion rubles of state funds. It bears mentioning that as the kolkhoz economies became stronger at a rapid rate, an increase took place in the capital investments by kolkhozes in developing the branch. During the Tenth Five-Year Plan, the capital investments by kolkhozes throughout the republic increased by a factor of 4.4 compared to the figure for the 7th Five-Year Plan and their proportion with regard to the overall volume of capital investments increased from 39 to 45 percent during a comparable period.

As a result, the value of the agricultural fixed capital at the end of 1980 amounted to 6.8 billion rubles, or more than the 1965 level by a factor of 5. Land reclamation installations constitute more than one third of the overall value of the republic's fixed agricultural capital.

In the Lithuanian SSR, more than 3 million hectares, or 68 percent of all agricultural land, require drainage. As a result of planned and persistent work, almost 2.4 million hectares, or 76 percent of the area requiring drainage, were in fact drained prior to the commencement of the 11th Five-Year Plan mainly through the use of closed tile drainage.

Over the past three five-year periods, the power engineering capabilities of agriculture increased by more than threefold. Agricultural production is presently consuming nine times more electric power than was the case in 1965. During this period the pool of tractors increased by a factor of 1.6, grain combines -- by 2.6 and trucks -- by almost twofold. Mineral fertilizer deliveries were doubled. On the whole this created a situation wherein, notwithstanding the extremely unfavorable weather conditions of the last 3 years of the 10th Five-Year Plan, labor productivity on the average for the 1976-1980 period was higher by almost threefold than during the 1961-1965 period.

Simultaneously with strengthening the logistical base of agriculture at a rapid rate, further development took place in those branches of industry which supply it with logistical resources and which process the agricultural raw materials.

It was during the period following the March (1965) Plenum of the CPSU Central Committee that the giants in the production of mineral fertilizers appeared -- the Ionava Azot Production Association imeni XXV S'yezda KPSS and the Kedaynyan Chemical Plant. Compared to 1965, the production of mineral fertilizers in the republic increased by a factor of 5.2 and reached 3.1 million tons of conventional units in 1980. The production of agricultural machines and spare parts for them increased at a rapid rate during this period. The entire country is now familiar with the AVM type units used in the production of vitamin grass meal, grass meal granulators produced by the Neris Production Association, tractor engine fuel pumps of the production association "Vil'nyus Fuel Equipment Plant imeni 50-Letiya SSSR" and other agricultural machines and spare parts, the production of which increased by a factor of 6.7 on the whole during the 1965-1980 period.

As is well known, Lithuanian agriculture specializes in the production of high quality livestock products, especially milk and meat. Thus preferential development has been given to those branches of industry which provide services for livestock production and process its products, primarily the mixed feed industry. Large-scale mixed feed enterprises are distributed throughout the entire territory of the republic and they are responsible for producing rich mixed feed for all types and groups of livestock and poultry. The production of protein-vitamin additives has also commenced. Unfortunately, it bears mentioning that the opportunities for processing grain forage into full-value mixed feed and especially the production of protein-vitamin additives are not satisfying the republic's livestock production requirements.

Special attention has been given to developing the logistical base of the meat and dairy industry. In recent years the network of meat combines located in all zones throughout the republic has been augmented by large modern enterprises: the Alitus Meat Combine in the southern portion of the republic and the Utena Meat Combine in the northwestern portion. Six older enterprises have been expanded considerably and reorganized. Overall, the capabilities for processing livestock and poultry have more than doubled in recent years and at the present time they are making it possible to process at the sites all of the products being procured in the republic.

Sufficient capabilities have also been created for processing all of the milk being procured at the present time. In 1981, for example, 2.6 times more whole milk was produced than in 1965, cream butter -- 1.4 times and fermented cheeses --

3.4 times. During the 1965-1981 period, the production capabilities of the sugar industry were increased by a factor of 1.5.

In addition to strengthening and further developing the logistical base for all branches of the agroindustrial complex, importance is also attached to the planned implementation throughout the republic of specialization and concentration of agricultural production based upon interenterprise cooperation. In conformity with the programs for rayon planning, the consolidation of farms and their subunits has for the most part been completed and corrections have been introduced into the crop rotation plans and farm specialization.

At the beginning of the 10th Five-Year Plan, all of the kolkhozes, sovkhoses and other state enterprises in essence became part of territorial inter-farm associations. One association consists of an average of five farms; with an overall area of agricultural land of 16,000 hectares.

The territorial inter-farm associations arrange their work according to the principle of coordination of the activities of independent farms. The coordination functions are carried out by a council of the inter-farm association. Its activities are based upon the carrying out of inter-farm contacts among enterprises specializing in the production of definite types of livestock products and in field crop husbandry -- in the cultivation of individual technical crops, marketable potatoes or seed for grain crops and perennial grasses. In the process, the production of milk and grain is retained on all of the farms. With such a division of labor, the modernization and expansion of existing livestock production facilities and the creation of another logistical base, an opportunity is presented for achieving a level of production concentration, with minimal capital expenditures, that is deemed adequate for organizing production on an industrial basis.

Thus the formation of production centers continued in the rural areas during the past five-year plan, mainly through the reconstruction, expansion and modernization of existing installations and also the construction of new and large-scale livestock production projects. At the present time, there are already 470 dairy complexes each capable of maintaining 400 or more cows, 29 hog raising complexes for the fattening of from 12,000 to 54,000 hogs annually and three complexes each capable of fattening 4,000 head of young large-horned cattle stock.

As a result of production concentration and industrialization, rapid progress in poultry raising is ensured. The production of eggs and meat is concentrated at five large poultry factories, 22 poultry raising sovkhoses, 19 fishing farms and at a number of kolkhozes. The production operations at all of the poultry factories or farms are automatically controlled or completely mechanized.

The cultivation of sugar beets, flax and potatoes has been concentrated at specialized farms. The dimensions for the sowing areas for these crops, on the average per farm, are 130, 153 and 93 hectares respectively. Vegetable production is concentrated at 49 and horticulture at 24 specialized sovkhoses. An appropriate logistical base is being created at an accelerated tempo at the specialized farms and cadres of personnel are being formed for the purpose of converting the cultivation of these crops over to an industrial basis.

It bears mentioning that when implementing specialization and concentration in agricultural production and converting it over to an industrial basis, life prompts some new variants and requires that appropriate corrections be introduced into solutions arrived at earlier. For example, we drew the conclusion that we still must not be carried away by excessively large hog raising complexes. First of all the erection of such enterprises requires an extended amount of time and the diversion of large capital investments. In the final analysis the mastering of the projects is dragged out and the effectiveness of use of the invested funds lowered. Secondly, organization of the feed base and the utilization of farmyard manure become complicated. Thus, the plans for the 11th Five-Year Plan call for the completion of construction of large hog raising enterprises and thereafter to rely heavily upon the modernization and expansion of existing farms, while raising them to the level of industrial technologies. The plans call for the erection of new complexes for the fattening of no more than 12,000-15,000 hogs annually. Under the conditions imposed by inter-farm associations, many kolkhozes and sovkhoses are capable of maintaining such enterprises. In the interest of achieving more complete utilization of the potential afforded by kolkhozes and sovkhoses, for increasing the production of meat, we consider it advisable, at all establishments and for the next few years, not only to retain the hog raising operations on old farms but even to expand and modernize them to the degree that this is possible.

Purposeful and persistent work by the republic's party organization in carrying out the party's modern agrarian policies and the selfless work performed by leading personnel, agricultural specialists and all agricultural workers have ensured stable growth in the production of the principal types of agricultural products from one five-year plan to the next. During the 10th Five-Year Plan the average annual gross output volume for agriculture increased by 4.5 percent above the same indicator for the 9th Five-Year Plan, grain production -- by 16, meat in dressed weight -- by 6, milk -- by 5 and eggs -- by 16 percent.

Very impressive growth was recorded in the production of agricultural products during the entire period following the March (1965) Plenum of the CPSU Central Committee. The average annual gross output volume during the 10th Five-Year Plan increased by a factor of 1.6 over the figure for the 1961-1965 period, grain production -- by 2.4, sugar beets -- by 1.6, meat in dressed weight -- by almost twofold, milk -- by 1.5 and eggs by a factor of 1.9.

An important source for supplementing the food resources is that of increasing the production of fish. The overall fish catch during the 1965-1981 period increased by a factor of 2.4, including in industrial ponds -- by a factor of 9.5.

The growth in the gross yields of agricultural products and in the production of livestock products was achieved mainly by raising the cropping power of the agricultural crops and the productivity of the livestock and poultry. For example, the average annual cropping power for grain crops during the 1976-1980 period was 23.3 quintals per hectare, compared to 10.8 quintals per hectare on the average during the 1961-1965 period. The cropping power of sugar beets during the same period increased from 125 to 207 quintals and potatoes -- from 111 to 138 quintals. For this same period of time, the milk yield for a cow in the public herd increased by 1,145 kilograms and reached 3,193 kilograms on the average for the 1976-1980 period. The egg production of laying hens almost doubled and reached an average of 232 annually. A considerable increase took place in the weight increases in the

live bulk of cattle and hogs during fattening and improvements were realized in their weight conditions for sales purposes.

As a result of production intensification, considerable growth was achieved in state procurements of agricultural products. Compared to 1965, grain procurements in 1981 increased by a factor of 3.6, sugar beets -- by 1.3, potatoes -- by 2.3, vegetables -- by 4, fruit and berries -- by 4.7, livestock and poultry -- by 2.1, milk -- by 1.7 and eggs -- by a factor of 5.6.

However, it bears mentioning that despite the above we still encountered a number of difficulties during the past few years in pursuing the policy of improving the well-being of the people and particularly in connection with supplying the population with meat and milk. It is understood that these difficulties have an objective basis. Similar to the entire country, the republic lived through three poor weather years in a row during the past five-year plan and this seriously held back agricultural development. Moreover, the unfavorable weather caused a great amount of damage not only during a particular year, but in addition it also affected agricultural development during subsequent years, even those considered to be relatively favorable for agricultural production. Thus in 1981, for the republic on the whole, the plans for procurements of all of the principal types of field crop husbandry products were fulfilled and this was valued highly by the party and state. Nevertheless the actual cropping power and gross yields for the principal agricultural crops turned out to be lower than the planned tasks. Last summer was a relatively favorable one and yet the washing away of nutrients from the soil during previous years played an adverse role; such nutrients are not returned to the soil in the course of just one year's time.

Livestock production was affected even more by the adverse consequences of previous years. A feed shortage not only led to a reduction in the production of goods during these unfavorable years but in addition it seriously affected the potential productivity of the animals, especially the milking herd, for subsequent years. Thus, notwithstanding an abundance of pasture feed, the productivity of the milking herd did not increase last year.

Beyond any doubt, these difficulties would have been less noticeable if a number of subjective factors could have been avoided. The 1981 results once again revealed disparate levels in management at kolkhozes, sovkhoses and even in individual rayons. In all of the soil-economic zones there are many farms which, despite the objective circumstances, have been able to maintain a high level of intensity in the principal branches of production and even to realize improvements in the economic indicators. At the same time, neighboring farms operating under the same conditions are lagging seriously behind. This points to a number of factors and particularly to shortcomings in the work being performed by leading personnel and the farm specialists and to a lack of proper persistence and purposefulness in the dissemination and introduction of leading experience, organizing labor and production, in the campaign to achieve a high culture of farming and livestock production and in the use of internal reserves for developing production and raising its efficiency.

The republic's party organization, guided by the decisions handed down during the 26th CPSU Congress and the May (1982) Plenum of the CPSU Central Committee, is concentrating its efforts on eliminating these shortcomings.

The chief task of the 11th Five-Year Plan, as formulated during the 26th party congress is that of achieving further growth in the well-being of the Soviet people. The foundation for carrying out this task must be stable and progressive development of the national economy, accelerated scientific-technical progress and conversion of the economy over to the intensive path of development, more rational use of the country's production potential, maximum economies in the use of all types of resources and improvements in the quality of the work being carried out.

The purpose of the party's economic policies with regard to improving the well-being of the people is reflected in the great amount of attention which the May (1982) Plenum of the CPSU Central Committee devoted to the food problem. The goal of the food program and the measures contained in it consists of supplying the population of the country with food products in a reliable manner and as rapidly as possible. In addition to being a priority economic task, it is also a vital socio-political one. The satisfaction of the vital needs of the Soviet people, as emphasized very definitely in a speech by L.I. Brezhnev, has been and continues to be a most important program requirement of our party. The complexity of the problem requires the attraction of large additional resources, the implementation of a system of measures of an inter-branch nature and the coordination of the efforts of a large number of organizations for the purpose of carrying out an entire complex of mutually related measures concerned with solving the same task. This is why our party's congress considered it necessary to assign the task of developing and implementing a food program, one which would unite the efforts of agricultural workers and many others associated with agriculture-related branches in the production, procurement, storage, processing and transporting of products and in the trade in these products, in behalf of a common final goal: to supply the country with the required quantities and the proper variety of agricultural products in accordance with schedules planned in advance.

At the same time, the solving of the food problem presupposes that full use will be made of the various methods for increasing the production of agricultural products. Here we have in mind not only a maximum intensification of production operations at kolkhozes and sovkhozes but also the efficient management of the private plots of the population and the subsidiary farms of industrial and other enterprises and the maximum utilization of all local food resources.

Measures are being developed in the republic for carrying out the food program by implementing a complex of measures aimed at the intensification of all branches of agricultural production, increased production specialization and concentration and the development of agroindustrial integration. The plans call for a considerable increase in the production of all types of agricultural products.

The planned growth in the production of field crop husbandry and livestock production products will ensure an increase of 10 percent in the average annual gross output volume for agriculture during the 11th Five-Year Plan, compared to 4.5 percent during the 10th Five-Year Plan. On farms in the public sector, this indicator must be 19.3 percent compared to 15 percent for the 10th Five-Year Plan. The increase in output will be achieved mainly by raising the cropping power of the agricultural crops and the productivity of the livestock.

Based upon production growth, a considerable increase will be achieved in state procurements of products, especially livestock products. The plans call for the

procurements of livestock and poultry to be raised to 660,000 tons in live weight in 1985, milk -- to 2.25 million tons and eggs -- to 570 million.

The general secretary of the CPSU Central Committee, Comrade L.I. Brezhnev, proclaimed from the tribunal of the 26th party congress: "The CPSU Central Committee wishes to inform the republic's party organizations, the krays and oblasts, the rayon party organizations and all agricultural workers that livestock production is today considered to be an important front for work in the rural areas." The chief factor restraining further intensification of livestock production operations is the fact that the feed base has fallen behind.

In responding to the appeal to make the 11th Five-Year Plan a five-year plan devoted to feed, the Plenum of the Central Committee of the Communist Party of Lithuania, in October 1981, examined the question of strengthening the feed base. An extensive program of measures was approved the implementation of which must achieve the goals set forth for livestock production for the 11th Five-Year Plan.

The foundation for solving the feed problem has been and continues to be that of increasing the production of grain mainly by raising the cropping power of the grain crops. The method for accomplishing this -- raising the culture of farming, improving the sowing structure for grain crops and introducing into operations early ripening varieties of spring grain crops that are more productive and more resistant against lodging and diseases. A great amount of attention is being given to carrying out measures aimed at combating grain losses during the harvesting stage.

Another important direction to be followed for solving this problem -- lowering the proportion of grain in the feed balance. This requires a sharp increase in the production and improvements in the quality of other types of feed, particularly coarse, succulent and pasture feed. The task has been assigned of having each farm procure sufficient quantities of the required assortment of these feeds to satisfy the requirements of both the public herd and the livestock being maintained on a private basis by kolkhoz members, sovkhos workers and other citizens.

At the present time, more than 37 percent of the agricultural lands are occupied by perennial grasses or cultivated haying and pasture lands. Since these feed lands are located for the most part on reclaimed lands, improvements must be realized in their utilization. In view of the fact that on reclaimed lands the return realized in the form of additional agricultural crop yields is achieved on the basis of all of the agrotechnical measures employed, it is considered necessary to cultivate on these lands not only grain crops but also the more valuable and rich with protein forage crops: alfalfa, clover and fodder beans and to expand the intermediate and secondary sowings of forage crops. In the interests of the state, the applications of mineral fertilizers in behalf of crops planted on reclaimed lands should be increased without delay to the optimum amounts. Unfortunately, the mineral fertilizer funds are presently satisfying only slightly more than 60 percent of the republic's agricultural requirements and no substantial increase in such fertilizer is called for prior to the end of the five-year plan. Certainly, this is delaying the receipt of a proper return from the considerable state funds invested in land reclamation.

The agricultural workers and land reclamation specialists in Prenayskiy Rayon have initiated a movement to improve the use of reclaimed lands. This initiative has

been approved by the Central Committee of the Communist Party of Lithuania and it is being supported by the republic's farmers and land reclamation specialists.

Special attention is being concentrated on solving the problem of protein in the feed. Here a chief concern consists of improving the cultivation of pulse crops, expanding the areas used for the growing of alfalfa, fodder beans and peas and raising the proportion of leguminous grasses in perennial grass stands and on cultivated haying and pasture lands. The task has been assigned of raising the pulse crop area in the grain crop structure to 13-15 percent over a five-year period and the cropping power -- to 20-25 quintals per hectare.

Radical improvements must be carried out in the cultivation of pulse crop mixtures for silage and green feed, which occupy large areas of arable land, but their average cropping power does not exceed 120 quintals of fodder per hectare. In the meantime, leading farms are obtaining 300-360 quintals per hectare.

The situation with regard to supplying the mixed feed industry with protein components has become complicated. Although the production of mixed feed in the republic increased by 34 percent during the 10th Five-Year Plan, the deliveries of protein components actually decreased. This led to a reduction in the quality of the mixed feed and hence to over-expenditures in their use. Measures are being undertaken aimed at making maximum use of all available resources for increasing the production of protein components on the spot. The plans call for an expansion in the production of meat and bone meal, dry skim milk and whole milk substitute at enterprises of the meat and dairy industry and the processing into dry meat and bone feed of the waste products obtained from the processing of poultry at poultry factories.

But the problem cannot be solved only by carrying out the mentioned measures. The development of capabilities for producing nutrient yeasts must be accelerated at the Kedaynyay Biochemical Plant, more extensive use must be made of the potential possessed by the Lithuanian production association of the fishing industry for processing waste products into fish meal and the means must be found for obtaining additional deliveries of protein components from other regions of the country.

The plans call for additional measures aimed at improving the cultivation of food roots, which the farms are cultivating on 40,000 hectares. Owing to a considerable increase in cropping power, their cultivation should be increased by no less than a factor of 1.5 by the end of the five-year plan. In view of the high labor intensiveness involved in this cultivation work, especially when harvesting a crop of fodder beets, at a portion of the farms and especially at those which specialize in the fattening of livestock, it is recommended that the sowings of semi-sugar beets be expanded. This will make it possible to take advantage of the equipment and technology employed in the cultivation of sugar beets.

Life has assigned the task of returning potatoes to the rank of a forage crop. This is first of all associated with the need for realizing maximum economies in the use of grain. In 1981 many farms began once again to grow potatoes on small areas for internal purposes. Today the task is one of expanding these sowings for livestock feed purposes, particularly as a component in mixed silage for hogs.

In the production of agricultural products, a considerable role is played by the private plots of the population. Such plots make it possible to satisfy to a better degree the increasing requirements of the rural population and to increase the



sale of agricultural products to the state. Approximately 560,000 head of large-horned cattle, including 316,000 cows, and 519,000 hogs are being maintained on these private plots of the population. Moreover, notwithstanding the reduction in the number of rural residents, in early 1982 there were 2 percent more large-horned cattle and hogs in this sector than there were 2 years ago. In 1981 the proportion contributed by the private plots of the population to overall milk production was 36 percent, meat -- 24.5 and eggs -- 40 percent.

During the past few years, important measures have been carried out throughout the republic aimed at encouraging the production of products on the private plots and their sale to the state. In the first place, everything is being done to create favorable conditions for maintaining livestock on these plots. During the course of resettling rural residents from farmsteads to kolkhoz and sovkhoz settlements, a program was followed of constructing mainly single-apartment dwellings. In the rural areas at the present time not one apartment is being placed in operation without farm buildings. For the purpose of acquiring an orchard and garden directly at a central farmstead, the land plot has been increased to one quarter of a hectare. In order to ensure that kolkhoz members and sovkhoz workers residing in cities of rayon subordination and settlements of the municipal type (former rayon centers) enjoy equal opportunities for maintaining private plots, the settlements of the municipal type have been transformed into central settlements of nearby kolkhozes and sovkhozes.

Grain crops and in some areas potatoes are being grown for kolkhoz members and sovkhoz workers on common tracts using the resources of the farms, with subsequent payments for expenditures. The pastures and haying lands for livestock maintained on a private basis by the population are located as close as possible to the settlements.

Increasing assistance is being furnished to the rural residents in acquiring livestock, young pigs and young poultry stock and in selling mixed feed to them. In 1981 the kolkhozes, sovkhozes, inter-farm hog raising enterprises and poultry factories sold 680,000 young pigs and 4.6 million head of young poultry stock to the population. The majority of the cows of kolkhoz members and sovkhoz workers are artificially inseminated in like manner as the public herd and free of charge.

The measures undertaken to stimulate and convert over to a contractual basis the production and sale of livestock products to the state by the private plots are producing positive results. During 1981, an average of 1,784 kilograms of milk was obtained per cow maintained on the private economy. Compared to 1980, milk procurements from the population had increased by 4 percent and the proportion of this sector with regard to the overall state procurements of milk had increased from 28.5 to 29.5 percent. The procurements of livestock and poultry from the population during 1981 increased by 11 percent and their proportion of the overall volume of procurements -- from 12.2 to 13.7 percent.

It bears mentioning that the potential of the private plots for increasing the production and sale of products to the state, mainly livestock products, has by no means been exhausted. In 1981, approximately 20 percent of the rural families were not maintaining cows and more than 25 percent -- hogs. Work aimed at attracting more of them into participating in this very important work, for both the state and the people, is continuing.

The socialist industrialization of Soviet Lithuania has brought about radical changes in the social structure of the population. The ranks of the working class have increased and improvements have taken place in the cultural-domestic living conditions of the people coincidental with growth in the cities. Compared to 1965, when only 15 percent of the republic's entire population lived in cities, at the present time -- more than 62 percent.

But recently these positive social processes have begun to uncover some extremely serious problems. During the period from 1965 to 1980 alone in the Lithuanian SSR, the number of those working in agricultural production decreased by almost one third. The age structure of the rural population is changing in a negative manner. This process is being aggravated and accelerated by the farmstead system for the resettlement of rural residents and the associated backwardness of their cultural-domestic living conditions. As a result, a shortage of labor resources has arisen at many kolkhozes and sovkhoses which is especially acute during the period devoted to harvesting the agricultural crops.

The interests of achieving further intensification of agricultural production and raising its efficiency require a reduction in the loss of manpower from agriculture and the creation of conditions which will promote in the best possible manner the retention of specialists and workers in the mass professions in the rural areas. This is possible only if an overall approach is employed for solving the tasks concerned with the economic and social development of the rural areas.

Priority importance is being attached to implementing measures aimed at radically improving the living, working and cultural conditions in the rural areas and raising them as close as possible to the municipal level. A program has been developed for the distribution of production and socio-cultural installations for the period up to 1990.

During the years that the kolkhoz system has been in operation, a radical change has taken place in the nature of peasant labor: from heavy manual labor it has been transformed into a mechanized type of industrial labor. The productive force of human hands has been increased tenfold by an abundance of mechanical and electric motors. Over the past 2 decades the power engineering capabilities of the branch have increased by a factor of 5.8 and the power-worker ratio -- by a factor of 9 and by 1980 it had exceeded the figure of 34 horsepower per worker. The majority of the kolkhozes and sovkhoses now have at their disposal well equipped workshops for the repair of equipment. Garages and shelters have been installed for the more costly and complicated machines and mechanisms. The enterprises of Goskomsel'khoztekhnika are carrying out an increasing volume of capital repair work on tractors, other items of equipment, assemblies and units.

The working conditions in this branch are changing owing to the rapid concentration and industrialization of livestock production operations. Today the livestock production complexes are essentially plants in which all of the production operations are carried out using machines and mechanisms. During the 10th Five-Year Plan alone, complex mechanization in cattle husbandry increased from 17 to 47 percent and in hog raising -- from 42 to 69 percent. By the end of the 11th Five-Year Plan, 80 percent of the facilities for large-horned cattle and 90 percent of the hog raising farms will be completely mechanized and this will make

it possible not only to alleviate the work of the livestock breeders but also to ensure a stable regime for their work and relaxation. The conversion over to daytime work hours at livestock production farms is important from both a social and economic standpoint.

And although a great amount of work still remains to be carried out in order to improve the working conditions of the machine operators and livestock husbandry workers, nevertheless the measures already implemented have had a noticeable effect on the retention of personnel. More youth are coming here to work and the general educational and professional level of the workers is rising.

An army of 70,000 machine operators and motor transport drivers are presently at work out on the kolkhoz and sovkhoz fields; compared to 1965, its ranks have increased by a factor of 4.8. More than 73 percent of the tractor operators and machinists are classified as 1st or 2d class specialists. Each year the ranks of machine operators are being augmented by 5,000-6,000 young specialists who have completed programs at agricultural professional-technical schools. Of 74,500 workers attached to livestock production farms and complexes, 32 percent are 1st or 2d class experts compared to only 11.5 percent in 1975.

Nevertheless this growth in the number of machine operators and livestock personnel is lagging behind the requirements for them. At the present time there is a shortage of approximately 20,000 machine operators and 15,000 livestock production workers.

Additional measures have been developed in the republic for improving the availability to agriculture of labor resources and the retention of youth in the rural areas. The principal method for solving this problem -- expanding the training of personnel in the mass professions within the system of professional education. Towards this end, future plans call for the construction of 20 SPTU's /sel'skoye professional'no-tekhnicheskoye uchilishche; agricultural professional-technical school/, such that each rural region will have a school. In the process, importance will be attached to training workers in those professions and in those quantities required in a particular area. The range of professions for women is expanding and womens' groups are being established at each school. The number of youth attending SPTU's will be increased to 12,000. And whereas during the years of the 10th Five-Year Plan 56,700 skilled workers were trained in the mass professions for agriculture, during the 11th Five-Year Plan such training will be provided for 63,000 workers.

A great amount of laborious work must be carried out in connection with the professional orientation of rural youth, so as to motivate more young men and women to devote their lives to the difficult but very necessary and honorable work of a grain grower. This work is attracting the party, soviet, professional trade union and komsomol organizations, farm leaders and specialists and the teaching collectives of rural general educational schools. Stronger contacts are being established between the farms and SPTU's on the one hand and school students on the other.

The domestic and cultural conditions of the rural workers play a special role. Life has convincingly shown that all problems concerned with the economic and social development of the rural areas are solved more successfully at those farms which, earlier than other farms, are able to create modern and well organized

rural settlements and to resettle all residents from farmsteads in them. Such farms do not experience difficulties with personnel in the mass professions and it is here that one finds the highest level of production intensity and economic efficiency.

During the 10th Five-Year Plan, 52,000 dwellings and apartments were built in the rural areas, the number of farmsteads was reduced by 40,000 and at the present time 63 percent of the rural residents are living in kolkhoz and sovkhos settlements.

The residents of farmsteads prefer to transfer to large settlements where all of the necessary socio-cultural facilities are available: schools, pre-school childrens' institutes, palace of culture, trade enterprises, dining hall, medical and domestic services units and municipal conveniences. The same farms which were pushed into the background by the construction of these installations sustained the greatest losses in labor resources during the resettlement process from the farmsteads. There were many such farms. It was for this reason that the 18th Congress of the Communist Party of Lithuania assigned the task for the 11th Five-Year Plan of erecting and equipping a majority of the above-mentioned installations in the central settlement of each farm.

The overall approach towards solving the tasks of economic and social development in the rural areas, which the party's organization has carried out in a persistent manner throughout the republic, has beyond any doubt played and will continue to play a most important role in implementation of the party's agrarian policies. But it must be emphasized that considerable importance is being attached to a number of problems remaining to be solved for the country as a whole.

A great amount of work has been carried out throughout the republic in connection with the training and education of agricultural specialists. There are presently more than 47,000 specialists working throughout the branch as a whole, including 13,000 who possess higher educations. However, there is still a shortage of specialists possessing high qualifications. But the principal concern is not simply a matter of an insufficient number of these specialists being produced.

On 24 March 1982, when speaking during festive celebrations held in Tashkent, Comrade L.I. Brezhnev focused attention on the need for "utilizing the intellectual potential acquired in a judicious manner." (PRAVDA, 25 March 1982). It was mentioned that quite often specialists are not employed as intended in Uzbekistan and that of the overall number of agricultural specialists less than one half work directly at kolkhozes and sovkhos. Unfortunately, only slightly more than one half of all of the agricultural specialists possessing higher educations work on farms in the Lithuanian SSR. More than 48 percent of these specialists work in organs of administration at the republic and rayon levels and in various departments which provide services for agriculture, where their influence upon production operations is extremely negligible. The reason lies in the fact that these specialists attached to administrative elements spend the principal portion of their time performing office work and composing a large number of planning indicators, which require a great flow of paperwork and reports.

The most important prerequisites for success in improving the administration of agriculture and other branches of the agroindustrial complex are set forth in the decisions handed down during the May (1982) Plenum of the CPSU Central Committee.

Beyond any doubt, the kolkhozes and sovkhozes are the central units of the agroindustrial complex. Thus the best agricultural specialists and production organizers must work precisely at the kolkhozes and sovkhozes. Over the past few years, the structure of the leading personnel at agricultural enterprises throughout the republic has improved noticeably. But there is still a considerable number of farms which, owing to unfavorable soil-climatic and weather conditions in recent years, have turned out to be economically weak. These farms need to be strengthened mainly through the addition of experienced leaders and specialists. For the purpose of retaining leading workers and specialists at the kolkhozes and sovkhozes and reinforcing their material interest, a number of privileges have been established for persons who have transferred over to work at low profitability or unprofitable farms.

As a result of raised wholesale prices in recent years, the expenditures of kolkhozes and sovkhozes for acquiring logistical resources and various types of services have increased considerably. This was one of the principal causes of the reduction which took place in the profitability of public production and the complications in the economic activities of the farms. The decision which has been adopted with regard to raising the state procurement prices for the more important types of agricultural products and other measures will serve to strengthen the kolkhoz and sovkhoz economies and intensify their interest in increasing the production and improving the quality of products.

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The agricultural workers of Lithuania, inspired by the decisions handed down during the 26th party congress, performed in a selfless manner during the first year of the new five-year plan. Although the consequences of the previous unfavorable period have been reflected in fulfillment of the planned tasks and socialist obligations, nevertheless the plans for selling field crop husbandry products to the state were over-fulfilled to a considerable degree. The general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, Comrade L.I. Brezhnev, congratulated the republic's workers upon the occasion of this labor success.

Among the winners of the 1981 all-union socialist competition awarded challenge red banners of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, there were 19 worker collectives from agriculture and other branches belonging to the republic's agroindustrial complex.

Having responded to the decisions handed down during the May (1982) Plenum of the CPSU Central Committee and striving to prepare for the 60th anniversary of the USSR in a worthy manner, the field and farm workers are campaigning to achieve new goals in production intensification during the second year of the five-year plan. In the socialist obligations of the farmers for 1982, the plans call for the following average yields to be obtained per hectare: grain -- 26-27 quintals, potatoes -- 150, sugar beets -- 250 and vegetables -- 148 quintals. The average milk yield per cow must be raised to 3,050 kilograms. Approximately 591,000 tons of livestock and poultry in live bulk, 2.07 million tons of milk and 531 million eggs must be sold to the state.

The carrying out of the spring sowing work during the best agrotechnical periods and at a high quality level, the thorough tending of the crops, the procurement of

feed along a broad front and the efficiently organized pasture period in livestock production all testify to the ardent desire on the part of the agricultural workers to carry out successfully their socialist obligations and to multiply their contribution towards the national campaign for implementing the decisions handed down during the 26th CPSU Congress and carrying out the food program.

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## TILLING AND CROPPING TECHNOLOGY

### INCREASING SUGAR CONTENT OF SUGAR BEETS

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 82 pp 54-58

/Article by A. Makarov, V.A. Knyazev, candidate of technical sciences and chief of a laboratory at the All-Union Scientific-Research Institute of the Sugar Industry and A.G. Matsebera, chief of a department at Ukrsakharprom of the UkSSR Ministry of the Food Industry: "Intensifying Interest in the Indicator for Sugar Content in Beet Raw Materials"

/Text In the successful fulfillment of the broad program for further improving the well-being of Soviet people, as planned by the 26th CPSU Congress for the 11th Five-Year Plan and for the period up to 1990, an important role is assigned to solving the food program, the foundation of which is the development of agriculture and other branches of the agroindustrial complex.

One of the most important component parts of the food program is that of supplying the country's population with sugar and thus the sugar beet complex must undergo further development and improvement. Its activity in future years will be evaluated in terms of the sugar yield obtained from each hectare sown in sugar beets and the level of this indicator will depend upon the productivity of the beet fields, the quality of the beet raw materials made available for processing and upon the operational effectiveness of the sugar plants. Definite reserves are available in each of these production sectors which, for a number of reasons, are still not being utilized adequately.

Computations carried out based upon the data of strain testing stations and leading farms reveal that in the Ukrainian SSR alone the potential opportunities afforded by beet plantations are making it possible to raise the sugar yield from each hectare to almost 80 quintals. The actual sugar yield from a hectare of industrial sowing, determined upon the delivery of beets to the sugar plants, amounts to 44-45 quintals and the yield (output) of sugar in the form of finished product is even less -- approximately 27-30 quintals per hectare.

Improvements in the quality of the beet raw materials and a reduction in losses during their storage and processing play a special role with regard to increasing the overall yield of sugar. With the conversion of the beet growing farms over to mechanized methods for the cultivation and harvesting of sugar beets, the sugar industry, in carrying out the food program with regard to sugar production, is beginning to sense to a greater degree the dependence of the output production volumes upon the quality of the beet raw materials being made available for

processing. In addition to an overall deterioration in the technological qualities of the beets, associated with an increase in their contamination and a raised amount of mechanically damaged, sour and frozen root crops, a trend was noted towards a reduction in their sugar content and an increase in them of harmful non-sugars, which on the whole is bringing about a considerable reduction in the sugar yield from each hectare of sowing.

Back in the early 1970's, a question arose with regard to eliminating the deterioration that had been observed in the technological qualities of the sugar beets and other agricultural products. Since that time, the All-Union Scientific-Research Institute of Sugar Beets, jointly with other scientific-research organizations, agricultural stations, agricultural organs and leading farms, has created and is introducing into production operations a number of new sugar beet varieties and hybrids which are characterized by a raised cropping power and sugar content. A progressive technology for the production of beet raw materials which involves minimal expenditures of manual labor and a highly efficient organization of harvesting-transport operations has also been developed and is being employed in actual practice. All of this is making it possible to achieve not only fulfillment of the procurement plan for beet raw materials but also high indicators for obtaining and producing sugar from each hectare sown in sugar beets.

A good example of this is the well known labor successes achieved in collaboration between the beet growers and workers attached to sugar plants in Yampol'skiy Rayon in Vinnitsa Oblast, Zhashkovskiy Rayon in Cherkassy Oblast, Mironovskiy Rayon in Kiev Oblast and others. In carrying out the decisions handed down during the 26th CPSU Congress, many of the country's beet growers converted over to the cultivation of beets using the industrial technology during the first year of the 11th Five-Year Plan. In 1981, for example, beets were grown in the Ukraine using this progressive method in 12 rayons on an area of more than 120,000 hectares. The plans call for all beet production operations to be converted over to the industrial technology by the end of the five-year plan. The positive experience accumulated by individual rayons in improving the quality of the beet raw materials being supplied to the sugar plants should be disseminated on an extensive scale and as rapidly as possible in all of the country's beet growing zones.

The intensification of beet growing operations, the increase in the quantities of fertilizer and herbicides being employed in the branch and the extensive introduction into production operations of highly productive varieties and hybrids, in addition to the complex mechanization of production processes, have made it possible to raise noticeably the cropping power of sugar beets in the Ukraine, Moldavia, Belorussia and other beet growing republics. For example, the average annual cropping power for industrial sugar beets at kolkhozes and sovkhozes in the Ukrainian SSR during the 7th Five-Year Plan amounted on the whole to 199 quintals and during the 10th Five-Year Plan -- 299 quintals, or higher by a factor of 1.5. For the country as a whole, the average annual cropping power for this crop during the 10th Five-Year Plan and compared to the 7th Five-Year Plan increased to the same degree and amounted to 251 quintals.

At the same time, the trend towards a reduction in the sugar content in the beet raw materials is continuing. Moreover this reduction is being observed for varieties under cultivation on farms and also undergoing testing at Gossortset' /State Strain Testing Network/ (see Table 1, data from the UkSSR Ministry of



Table 1

Average Annual Sugar Content of Beets in Ukrainian SSR During 7th and 9th  
and Four Years of the 10th Five-Year Plan (in %)

Place Where Samples Were Taken For Sugar Content	1961-1965	1966-1970	1971-1975	1976-1979
Strain testing stations	19.6	18.4	18.2	17.6
Test plots of industrial sowings	18.0	17.4	16.7	15.7
Upon acceptance of beets by sugar plants	17.6	17.2	16.5	15.9

Agriculture and the UkSSR Ministry of the Food Industry). In his article entitled "Sugar Content and the Problems of Breeding Sugar Beets" (SAKHARNAYA PROMYSHLENNOST' /Sugar Industry/, No 4, 1981 pp 41-46), V.A. Panin thoroughly analyzed the reasons for the deterioration in the quality of the beet raw materials being supplied to industry and he drew the conclusion that the chief reason in recent years has been the extensive use in production operations of varieties and hybrids which are characterized by a low sugar content and low technological indicators. In this regard, interest is being displayed in the data (see Table 2) accumulated over a period of many years in the UkSSR, MSSR and BSSR on the dependence of sugar beet sugar content upon the degree of participation of polyploid hybrids in the sowings of this crop.

Beyond any doubt, it would be incorrect to explain the reduction in sugar content in beets only in terms of a change in the varietal structure and the extensive introduction into production of polyploid hybrids. To a large degree this is also caused by other factors, all of which require further study. The principal unfavorable factor was obviously failure to observe the technology for the cultivation and harvesting of sugar beets, while simultaneously introducing one-seeded sugar beet varieties and hybrids into operations on an extensive scale. The absence of varietal agricultural practices, the frequent use of common technological and agrotechnical methods in the cultivation of various strains, without taking into account their individual peculiarities and against a background of increased fertilization, especially nitrogen fertilizers (for example, the average N:P:K ratio for the UkSSR in recent years has been 1:0.6-0.7:0.8-0.9) and unfavorable weather conditions during some years -- all of these factors have served to bring about a reduction in the sugar content in beets in all beet growing zones in the Ukraine, Moldavia and some other union republics.

Single-seeded varieties and especially sugar beet hybrids are bred against a high agrotechnical background and thus they are more demanding with regard to observance of the agrotechnical methods to be employed in their cultivation. On beet growing farms in the Ukrainian SSR and Moldavian SSR which grow these varieties and hybrids, these methods are carried out with considerable violations and this factor, combined with unfavorable weather conditions, adversely affected the sugar content level in the beet raw materials. As an increase took place in the sowing areas for the single-seeded varieties and hybrids, the effect of the factors mentioned above on the overall sugar content level of the beets became more noticeable. At the same time, when cultivating only multiple-seed varieties of sugar beets (Uladvorskaya 096, Uladvorskaya 752 improved, Mezhotnenskaya 104 and Verkhnyachskaya 038) in the BSSR and employing a relatively stable technology for cultivating and harvesting the crop, despite the same unfavorable weather conditions during the growing seasons of

Table 2

Proportion of Sowings of Polyploidal Hybrids for Entire Area of Sugar  
Beet Sowings and Its Sugar Content (annual average)

Years	% of Polyploid Area of Overall Area Sown in Sugar Beets			Beet Sugar Content Upon Acceptance by Sugar Plants, %		
	UkSSR	MSSR	BSSR	UkSSR	MSSR	BSSR
1961-1965	0.0	0.0	0.0	18.05	18.90	16.49
1966-1970	7.2	2.4	0.0	17.41	18.19	16.23
1971-1975	26.2	19.9	0.0	16.73	17.22	15.98
1976-1980	36.2	69.2	0.0	15.80	16.20	16.00

individual years, the sugar content of the beets did not decrease and the sugar yield per unit of area actually even increased (see Table 3) as a result of raised technological qualities in the beet raw materials and improvements in the work of the republic's sugar industry enterprises.

It is known that single-seeded varieties and hybrids of sugar beets are late ripening and only by the end of the growing season at plant breeding stations and strain testing stations, assuming a high level of agricultural practices in their cultivation and manual harvesting, do they achieve a sugar content which in many instances exceeds the sugar content of multiple-seeded varieties. At industrial sowings of sugar beets, owing to relatively early harvesting periods (in September), 50-60 percent of the sowing areas for this crop have already been harvested prior to carrying out a comparative evaluation of the varieties (in October), in connection with which a relative reduction is also noted in the sugar content of single-seed beet varieties and hybrids. Hence a requirement exists for creating early ripening beet varieties and hybrids and, when conducting a comparative testing of them at strain testing stations, to take into account the principal indicators during two periods -- in September and October.

When evaluating sugar beet varieties and hybrids at strain testing stations and plant breeding stations, in addition to cropping power and sugar content a determination is also made as to the probable sugar yield per unit of space. However, no consideration is given to the fact that a large sugar yield per hectare, even with an equal sugar content among polyhybrids, is achieved mainly as a result of a higher cropping power. Nor is any consideration given, during a comparative evaluation of beet varieties, to the high quality (purity) of the purified juice. More often than not this indicator is determined only for the purpose of computing the probable sugar yield per hectare of sugar beet sowing. In this instance, a high cropping power compensates for a lower juice quality and a corresponding reduction in the sugar yield per unit of space when processing polyhybrid beets, especially during the initial production periods.

Thus, according to data supplied by the Belotserkovskiy Experimental Plant Breeding Station (SAKHARNAYA SVEKLA /Sugar Beets/, No 7, 1979 pp 38-39), on the average for the 1972-1975 period, the probable sugar yield per hectare of sowing of sugar beet polyhybrids (Belotserkovskiy Polyhybrid 2 and Belotserkovskiy Polyhybrid 1) amounted to 47.4 and 46.3 quintals respectively, with a cropping power of 283.4 and 288.4 quintals and a sugar content of 18.86 and 18.74 percent and from 1 hectare of sowing of multiple-seed varieties of it (Ramonskaya 06 and Verkhnyachskaya 038) --

44.8 and 45.1 quintals respectively, with a cropping power of 272.8 and 267.5 quintals and a sugar content of 18.91 and 19.5 percent. However the high quality of the purified juice obtained from polyhybrid root crops was 0.6-2.6 units lower than that from the root crops of multiple-seed varieties, as a result of which the sugar yield per unit of space, during the production processing of the former, turned out to be 0.3-1.3 percent less than during the processing of the latter. In such a case the production of sugar in the required volumes will be achieved mainly through the processing of a large quantity of beets and it will be accompanied by a corresponding increase in the consumption of raw materials, fuel and production materials and this will not promote the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Intensifying Work Aimed At Achieving Economies and Ensuring the Rational Utilization of Raw Materials, Fuel-Energy and Other Material Resources."

Table 3

Sugar Content of Beets and Sugar Yield From Beet Processing  
in Individual Beet Growing Republics

	Average Annual Sugar Content of Beets Upon Acceptance by Sugar Plants, %		Average Annual Sugar Yield, %	
	1966-1970	1976-1980	1966-1970	1976-1980
Ukrainian SSR	17.41	15.80	12.78	10.60
Moldavian SSR	18.19	16.20	13.36	10.89
Belorussian SSR	16.23	16.00	10.64	11.23

A similar situation developed with the Yaltushkovskaya single-seed variety, the sowings of which throughout the country at the present time constitute a considerable percentage of the overall area of sugar beet sowings. Compared to multiple-seed varieties, the high quality nature of purified juice obtained from root crops of this variety, according to data supplied by the above-mentioned authors, is lower by 0.8-2.4 units and this is equivalent to a reduction in the sugar yield per hectare of 0.4-1.2 percent, although the sugar content of its root crops surpassed the sugar content of the root crops of the multiple-seed Ramonskaya 05 and Verkhnyachskaya 038 varieties by 0.5 and 0.16 percent respectively.

The sugar industry workers have repeatedly insisted upon the need for using conventional hybrids and varieties instead of the widely used Belotserkovskiy polyhybrid 1, Belotserkovskiy polyhybrid 2 and Belotserkovskiy polyhybrid 19, since notwithstanding their high energy of root formation and productivity they are still ill suited for the industrial cultivation technology.

In connection with the conversion over to the mechanized formation of a planting density for beet plants, greater importance is being attached to such quality indicators of beet seed as their germinative capacity, germinative energy and multiple or single-seed capability, since it is upon these factors that the cropping power and sugar accumulation in the root crops are dependent to a considerable degree. However, it is extremely difficult to form a uniform planting density for the plants owing to the low germinative capacity and germinative energy of the seed and also the single-seed nature of the polyhybrid beets. And this in turn leads to

a sparseness of sowings, irregular placement of the plants in the rows and to a reduction in the cropping power of the beets and in their sugar content. Owing to the hybrid nature of such plants, especially in industrial sowings, variations are observed in the root crop forms -- they appear shorter with simultaneous growth of the heads and the appearance of hollowness. As a result, the head of each second and third root crop in a row rises 2-8 centimeters above the surface of the soil. The projecting portions of the root crops are to a large degree cut down by the working organs of the beet harvesting machines. In some instances the number of root crops cut from the middle downwards reaches 50-60 percent in a beet heap and the amount damaged -- in excess of 80 percent. In the process, a sharp increase takes place in the crop losses.

The subsequent storage of such raw materials at beet receiving stations of sugar plants is accompanied by definite difficulties and high losses in beet bulk and sugar, notwithstanding the fact that during testing carried out at experimental plant-breeding stations and strain testing stations the polyhybrid root crops dug up manually and by means of beet lifters revealed a higher degree of stability during storage than did the root crops of multiple-seed varieties.

In view of these circumstances, for example, a proposal has been introduced in a number of oblasts in the Ukraine calling for a sharp reduction in the proportion of sowings of the above-mentioned polyhybrids and the Belotserkovskiy Polyhybrid 30 in all industrial beet sowings from 48.2 percent in 1979 to 12 percent in 1982; they are to be replaced by sowings of beet varieties which are characterized by a higher cropping power and sugar content, uniformity of root crops, improved quality of seed and greater suitability for mechanized cultivation and harvesting (Yaltushkovskaya Single-seed 30, Belotserkovskaya Single-seed 34, Belotserkovskaya Single-seed 40, Uladovskaya Single-seed 35 and Veselopodolyanskaya Single-seed 29).

In the interest of achieving an overall increase in the sugar content level for beet raw materials, improvements should also be carried out in the system for the strain testing and regionalization of varieties. We are of the opinion that the standard for the strain testing stations must be a variety which under the given conditions reveals the highest productivity and sugar content for the root crops, in addition to high quality juice and seed.

The Ramonskaya 06 variety is presently being used as the all-union standard. However, it does not meet all of the above-mentioned requirements in all of the beet growing zones and in many instances it is even inferior in terms of these indicators, especially in terms of sugar content in the root crops and also when compared to more promising varieties. Thus, during the 1963-1967 period, the standard at strain testing stations in Cherkassy Oblast was the Verkhnyachskaya 103 variety, the sugar content of which was lower than that for the Ramonskaya 06 variety by 0.1 percent. If we take into account the fact that any new variety deemed promising for regionalization in Cherkassy Oblast in terms of its indicators turns out to be at the level of the accepted standard, then a variety becomes available for production sowings on the whole which is inferior in terms of sugar content to the earlier adopted standard Verkhnyachskaya 031 variety by 0.4 percent.

A clear example of this could also be the regionalization in certain oblasts of the Ukrainian SSR during 1982 of the Yubileyny hybrid, based upon a comparison of the indicators of strain testing stations for this hybrid against the indicators for

polyhybrids, with the data for this hybrid being inferior in terms of sugar content to earlier regionalized varieties. During the years in which the tests were carried out (1978-1980), the Yubileyny hybrid did not display any advantages over the Uladovskaya Single-seed 35 variety in terms of cropping power or sugar content, but it surpassed the Belotserkovskiy Polyhybrid 2 variety in Vinnitsa Oblast. In Kirovograd and Odessa Oblasts, in terms of cropping power of the root crops, it did not display any reliable advantages over the Belotserkovskaya Polyhybrid 1 and in terms of sugar content it was inferior to the new Yaltushkovskaya Single-seed 30 variety by 0.2-0.4 percent.

The sugar beet varieties bred at experimental-plant breeding stations for the purpose of uncovering their potential are usually tested against a rather high agrotechnical background. In order to solve the problem concerning their regionalization, indicators obtained at strain testing stations of Gossortset' are used as the basis. Meanwhile, it has been established that each variety reacts differently to the conditions under which it is grown. Thus a need exists for studying not only the potential of new varieties but also their productivity levels for production sowings at kolkhozes and sovkhozes in the particular zone for which the tested variety was considered promising.

In this regard, considerable value is being attached to a proposal by the Ukrainian Inspectorate of the State Committee for the Strain Testing of Agricultural Crops in connection with improving the processes employed for testing varieties at strain testing stations (KHLIBOROB UKRAINI, 1979, No 10, pp 12-13). In accordance with this proposal, during the first 2 years of testing a determination is made as to the promising nature of the new variety and during the third year a study is undertaken of its potential in oblasts where the variety is considered to hold promise and extensive production tests are carried out (on an area of approximately 300 hectares throughout the oblast as a whole). The sowings of the variety being tested are carried out at 2-3 kolkhozes in each zone following two different predecessor arrangements. Regardless of whether or not the variety was regionalized, the originating organization, following 2 years of testing, issues approximately 1,000 quintals of its seed for extensive production testing. If as a result of production testing it turns out that the variety tested surpasses the standard or the best variety by a reliable difference, then it can be regionalized for the zone.

A variety should not be regionalized if it is inferior in terms of sugar content to earlier regionalized or promising varieties. The new Yubileyny hybrid was regionalized in 1980 in Cherkassy Oblast despite the fact that, on the average for the 1978-1979 period and at a number of strain testing stations (Mankovka, Zolotonosha), the sugar content of its root crops was lower by 0.4-0.8 percent than that for the root crops of earlier regionalized and promising varieties. The Yubileyny hybrid, created using the plant breeding method of heterosis, based upon the TsMS lines, is classified as a productive variety (not necessarily sugar productive), with a low sugar content and a lower yield of sugar compared to cultivated varieties.

It should also be noted that the seed production of hybrids on a sterile basis is extremely complicated. The seed plants for the Yubileyny hybrid are cultivated in alternating rows: 12 rows of a male-sterile component -- 4 rows of a heterosis pollinizer -- one row for passage between the sowings. In the process, one third of the field is not used, the seed yield is decreased by almost twofold. When

reproducing male-sterile hybrids on an area of more than 30,000 hectares, as called for in the future, for the country as a whole it would not be beneficial to use a large area of highly productive land as the shortfall in beet seed would be considerable.

The shortcomings in seed production and the unstable indicators for sugar content in the Yubileyny hybrid raise some doubt as to the advisability of its extensive introduction into production operations at a given stage. Nevertheless, despite the objections of specialists attached to the USSR Ministry of Agriculture and the USSR Ministry of the Food Industry, this hybrid has been regionalized for 1982 in a number of oblasts in the Ukrainian SSR.

In order to raise the sugar content and improve the quality of the beet raw materials, equal importance is attached to ensuring that the beet growing farms are supplied with high quality seed for regionalized and promising sugar beet varieties and hybrids. Towards this end, a system of plant breeding and seed production institutes and organizations has been created throughout the country. However a variety must travel a long path before it is assigned to production. More than 10 years are required for the creation of a variety and somewhat less time -- for its testing and reproduction. The manifestation of the potential of a variety under production conditions is dependent upon proper observance of the agricultural practices for reproducing the seed and upon the plant breeders maintaining the best qualities of the variety.

Sugar beet varieties respond to the growing conditions and thus their valuable properties can be maintained and at times even improved through the process of seed production. On the other hand, their indicators for productivity can also fall sharply if violations are tolerated in the agrotechnical and seed production methods during the reproduction process. A change in the sugar content of sugar beets during propagation of the varieties is associated mainly with the absence of recommendations for high quality agricultural practices and with a change in the population of the variety. A requirement exists for the development of high quality agricultural practices and the beet seed production sovkhozes must undertake all of the measures required for growing the mother beets and seed plants on a high agrotechnical level, they must observe the high quality agricultural practices and in the process they must maintain the valuable biological, economic and other useful characteristics of a variety.

With the conversion over to mechanized processes for cultivating seed plants and mother beets at a number of farms in the RSFSR and in the Ukrainian SSR, reductions have taken place in the density of mother beet plantings, in the beet crop yields and in the cropping power of the seed plants. This is also reflected to a definite degree in the sugar content level and in other technological indicators for the quality of industrial beets cultivated from lower quality seed. In this regard, complete support for those farms engaged in producing sugar beet seed in the form of fertilizers, herbicides and equipment and also the observance by the farms of the agricultural practices employed in the cultivation of sugar beets will promote to a considerable degree improvements in the cropping power and sugar content of industrial beets.

In our opinion, shortcomings in evaluating the work of the plant breeding stations are reflected to a considerable degree in lowered sugar content in the beet raw

materials. This year the best station is that one which has a variety occupying a large area in industrial sowings and not that station the varieties of which are furnishing a large yield of sugar per hectare of sowing and per unit of processed raw material. The introduction of a new system for evaluating the work of the plant breeders and issuing them incentives for high sugar yields per unit of processed raw material, together with the creation of a single center for plant breeding and seed production work in beet production, would make it possible not only to achieve the former level of beet sugar content but in fact even surpass it.

Solutions must also be found as rapidly as possible for those problems associated with increasing the material interest of the beet growers in improving the quality of the beets and raising their sugar content.

During the 1973-1978 period, the sugar industry prepared the logistical base required by the raw material laboratories for carrying out mass analyses of the beet raw materials being delivered to the plants, for the purpose of determining their sugar content. However the experience accumulated in accepting and paying for the sugar beets, taking into account their sugar content (in conformity with the "Temporary Instruction On the Delivery (acceptance) and Payments for Sugar Beets Having a Raised Sugar Content"), has shown that such a payment system is not sufficiently effective for raising the material interest of the beet growing farms in improving the quality of the beet raw materials.

The information furnished above underscores the need for rapidly re-examining the varietal structure of the sugar beets being cultivated for the purpose of obtaining sugar from them and improving plant breeding and seed production work and creating and introducing more valuable beet varieties and hybrids into production operations. This will make it possible, with minimal expenditures of raw materials, to produce more sugar, examine the variety testing system and raise material interest in cultivating beets having a high sugar content.

In increasing the sugar yield per hectare of sugar beet sowing and per unit of agricultural raw material processed, a great contribution can be made by workers assigned to the sugar industry. Many facets of the work are dependent upon them: the high quality acceptance and storage of the beet raw materials, a reduction in the idle time of the plants, growth in their average daily productivity, rapid intensification of the capabilities and a reduction in the beet processing periods, an increase in the coefficient of equipment usage and maximum sugar production through a reduction in losses during processing of the raw materials.

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